DE HAVILLAND CANADA

TWIN OTTER SERIES 300

TWIN OTTER
Progress Report

THE DE HAVILLAND AIRCRAFT OF CANADA LTD., DOWNSVIEW, ONTARIO
A HAWKER SIDDELEY COMPANY

DATE ..... January 1971 .....
NUMBER ..... 19 .....

1970 REVIEW

TWIN OTTER SALES REACH 330

During 1970, orders for Twin Otters were received from operators in no fewer than 14 different countries - Argentina, Australia, Canada, Ecuador, Libya, Mexico, Nepal, New Caledonia, Nigeria, Norway, Pakistan, Panama, Peru and the United States of America - bringing the total order book to 330 at the year end. Orders came from trunk and regional airlines, oil and mining companies, government and military operators.

Pakistan International Airlines, with an order for six aircraft, joined the growing list of major carriers to choose the Twin Otter for their feederline routes. They will be used in both East and West Pakistan, serving 39 communities in remote sections of the country.

Wideroe's Flyveselskap, who have pioneered routes in Northern Norway with a single Twin Otter, placed an order for four more aircraft. Making use of STOL airports with 2,600 ft runways, they will be used to expand the existing service which has operated on a trial basis for two years.

Royal Nepal Airlines added another name to the list of airline operators, with an order for two aircraft.

The Peruvian Air Force, which has operated three 'Series 100' Twin Otters since 1967, will get eight 'Series 300' aircraft as part of a fleet standardization program.

Equipped with floats and making use of the many rivers of the upper reaches of the Amazon, they will be used in support of comprehensive civic action and economic development programs in the country's eastern interior.

The number of Twin Otters operating in the oil, mining and exploration role continued to grow with a total of eight aircraft delivered during the year to Amoco International, U.S.A.; Esso Standard and Oasis Oil, Libya; International Nickel, Canada; Mobil Producing, Nigeria and Yacimientos Petroliferos Fiscales, Argentina.

Despite the sluggish market for commuter aircraft in the U.S.A., six operators introduced or added more Twin Otters to their fleets during 1970. They were Air Wisconsin, Allegheny Commuter (operated by Atlantic City Airlines), Executive Airlines, Frontier Airlines, Los Angeles Airways and Rocky Mountain Airways.

In the Canadian Arctic, perhaps one of the toughest testing grounds for any aircraft, Atlas Aviation added two more Twin Otters to its fleet. At the opposite environment extreme - the jungles of New Guinea - Trans Australia Airlines added two more aircraft, bringing their Twin Otter fleet to 13.

Commenting on the prospects for 1971, our President, Mr. B.B. Bundesman, has this to say... "Our review of world markets indicates a steady demand for this type of airplane. The Twin Otter has become a world standard in its class and we expect this will reflect in continuing orders. The Twin Otter is a money-maker for the operator. It is also a modern STOL airplane and although its STOL performance is used by relatively few operators today, the increasing trends toward STOL operations will provide considerable additional impetus to Twin Otter sales."

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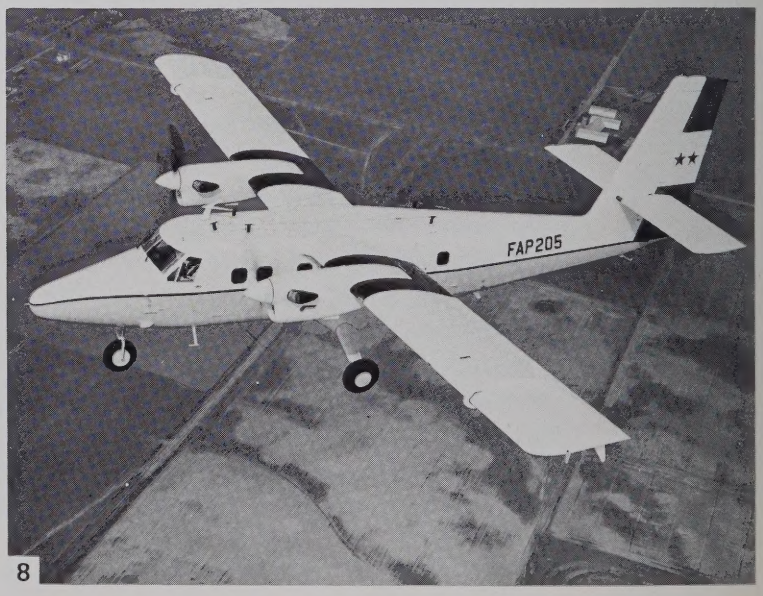

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1. Pakistan International Airlines joined the growing list of carriers to use Twin Otters on feeder line operations.
2. Air Wisconsin's N4043B became first Twin Otter to fly 10,000 hours.
3. A new Allegheny Commuter service, operated by Atlantic City Airlines, began in June.
4. Fifteen oil and mining companies including Esso Libya, now fly Twin Otters.
5. Trans Australia Airlines one of the early Twin Otter operators, now has thirteen.
6. Royal Canadian Mounted Police Twin Otter based at Yellowknife is used on operations throughout the North West Territories.
7. International Nickel purchased a second Twin Otter for use by its Canadian based exploration division.
8. The Government of Panama now operates a Twin Otter.

OPERATOR OF THE MONTH

MOUNT COOK AIRLINES

In October 1969 a new aircraft was seen in the skies above the popular summer and winter resort of Queenstown, New Zealand. With the ever-increasing tourist demand for sightseeing flights in the Southern Lakes Region, Mount Cook Airlines recognized the need for an aircraft with greater capacity and suitability for the varied conditions. The D.H.C. Twin Otter was ideal for these purposes and the new acquisition in its blue and white livery surmounted by the Mount Cook Lily symbol of the airline became the first of its type to go into service in New Zealand.

From its Queenstown base, the Twin Otter flies both scenic and scheduled services. Regular flights to the city of Dunedin link the more populous southern east coast of New Zealand's South Island directly with the inland holiday and skiing centre of Queenstown, which is also served by Mount Cook Airlines' HS.748 aircraft flying direct routes from Christchurch, largest of the South Island cities, and from Rotorua, the North Island's thermal tourist attraction.

Scenic flights in the Twin Otter cross the glacier-formed lakes Wakatipu and Te Anau to the rugged and precipitous terrain of Fiordland where dense native rain forest cloaks the mountains and spectacular waterfalls are climaxed by the 2,000 ft drop of Sutherland Falls. The destination of the aircraft is Milford Sound; a landing close to the Milford Hotel brings into view the world-famous silhouette of Mitre Peak, flanked by the sheer granite walls of the Fiord.

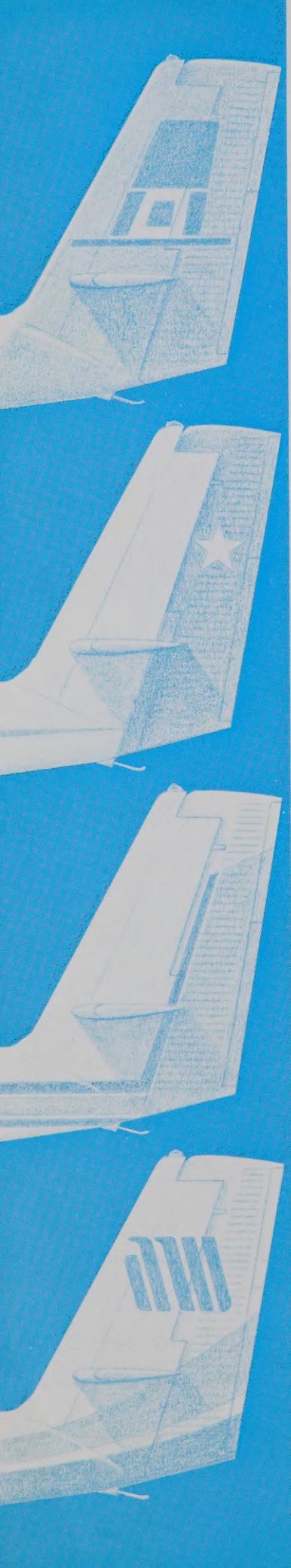
Passengers deplane at Milford Sound after a scenic flight from Queenstown.

From the 3800 ft level of the Coronet Peak ski field, Queenstown, the chairlift begins its ascent to within a few feet of the 5413 ft summit.

From Milford the Twin Otter begins the return journey to Queenstown without retracing the outward route. After flying the length of the Sound to the Tasman Sea, the aircraft turns inland to pass glaciers and snow-capped peaks before approaching Queenstown via the gold-bearing Skippers Canyon with its memories of the gold rush days of the 1860's, and Coronet Peak, the major South Island ski-field.

Regular operations such as the Dunedin run and the Milford sightseeing flights are augmented by charters to Te Anau, Mount Cook, Christchurch and other parts of New Zealand. The Twin Otter is called upon to operate in conditions varying from short unimproved airstrips at elevations from sea level to 2,030 ft, to the paved runways of Queenstown, Dunedin and Christchurch. Under these conditions it has averaged more than 1,100 landings per set of tires and more than 1,200 landings per set of brake pads. With an average flying time per month of 92 hours, the aircraft has carried a total number of 15,780 passengers over a twelve month period.

Twin Otter operations in the South Island of New Zealand entail flights under both VFR and IFR conditions, with the demands of rugged mountainous terrain with the associated air currents and landings in cross-wind conditions. The Operations Manager of the Airline's Queenstown division reports that the crews love the ruggedness, complete reliability and excellent handling characteristics of the Twin Otter and the engineers praise the fact that during the first year of operation there has been almost no unscheduled maintenance.



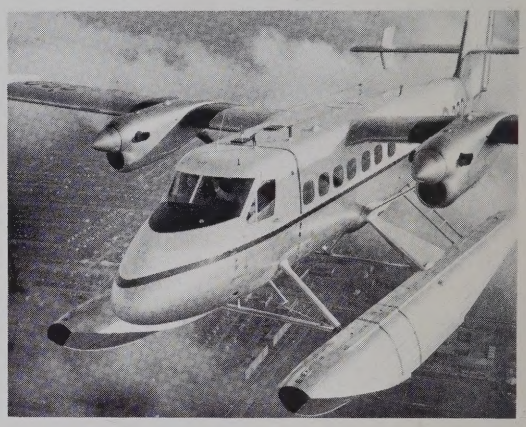
EIGHT MORE TWIN OTTERS FOR PERUVIAN AIR FORCE

After operating three 'Series 100' Twin Otters for three years, the Peruvian Government has placed a repeat order for eight 'Series 300' aircraft.

The eight Twin Otters are being acquired by the Peruvian Air Force as part of an extensive plan to modernize and standardize its transport fleet and will be operated by Grupo Aereo No. 42, based at Iquitos. In addition to the important advantages of fleet standardization and twin-engined operational safety over jungle areas, the 'Series 300' Twin Otters will provide 50% greater productivity than the existing fleet operated by the group.

Acquisition of these aircraft will enable the Peruvian Government to more effectively carry out its comprehensive and recently instituted programs of civic action and economic development of the country's eastern interior. Equipped with floats, the Twin Otters will make use of the many rivers of the upper reaches of the Amazon to provide a modern transportation link to scattered communities in the area. These routes are currently being flown by the three 'Series 100' Twin Otters, in operation since 1967 and six de Havilland Beavers, which have operated in the Peruvian jungle for many years.

The superior performance capability of the 'Series 300' Twin Otter makes this aircraft ideally suited for operation in the jungle



environment of the Peruvian interior. Equipped with more powerful PT6A-27 engines, the 'Series 300' has outstanding hot-weather performance characteristics, an important feature for the Iquitos-based operation. The simplicity, proven reliability and ease of maintenance of the Twin Otter are prime requisites for flying operations in these areas, where no sophisticated maintenance facilities exist.

This repeat order for Twin Otters, together with a recent order for 16 Buffalo aircraft, which will be operated by Peruvian Air Force Grupo Aereo No. 8, based at Lima, brings our total sales to Latin America during the past five years to over 135 million dollars.

ANOTHER TWIN OTTER TALE

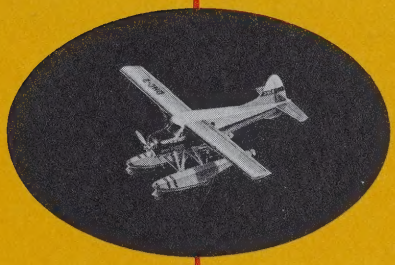
This Twin Otter was purchased by the Australian Bureau of Mineral Resources, after evaluation of several types of aircraft. It is the only aircraft in Australia - and possibly in the world - fitted with this type of equipment. Modification of the aircraft involved the design of special equipment by the Bureau of Mineral Resources. The installation was designed by Hawker de Havilland Australia and Trans Australia Airlines, who will fly and maintain the aircraft.

Unique features include an 18 ft boom on the righthand side rear fuselage, which extends 8 ft beyond the tail of the aircraft. The boom houses a magnetometer for detecting variations in the earth's magnetic field, caused by mineral deposits. Information processing and magnetic tape information storage units inside the cabin permit speedy processing of data when the aircraft returns to base.

Other features of the equipment include a Doppler navigation system with the antennae installed in a special 5' x 3' fibreglass "radome" under the aircraft to facilitate accurate tracking of the aircraft during survey runs plus a radar altimeter for exact height control and a vertical camera for photographing the terrain corresponding to the magnetometer indications.

In its geophysical role the aircraft will operate at a minimum height of 300 ft to a

maximum of 2,000 ft with a crew normally comprising two pilots and a Bureau of Mineral Resources Technician. It is expected that the geophysical surveys will normally take place between February and November with a mid-summer (in Australia!) stand-down for aircraft and equipment maintenance and refit.



THE DE HAVILLAND CANADA *Story*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MOTH AEROPLANES
THE DE HAVILLAND AIRCRAFT
OF CANADA LTD

THE DE HAVILLAND CANADA STORY

by Sandy A.F. MacDonald

ON A bleak, grey day in the early spring of 1927 a little group of men moved down the slipway fronting the seaplane works of Short Brothers at Rochester in England. Beneath a leaden overcast sky a fresh east wind drove little whisps of lower broken clouds scudding across the sky. There was a slight drizzle in the raw wind, and the men walked with their chins huddled within the upturned collars of their topcoats. In the party were F. E. N. St. Barbe, Sales Director of The de Havilland Aircraft Company, Limited, then established at Stag Lane Aerodrome, Edgware, and a visitor from Canada, Captain Roy Maxwell, Director of the Ontario Provincial Air Service.

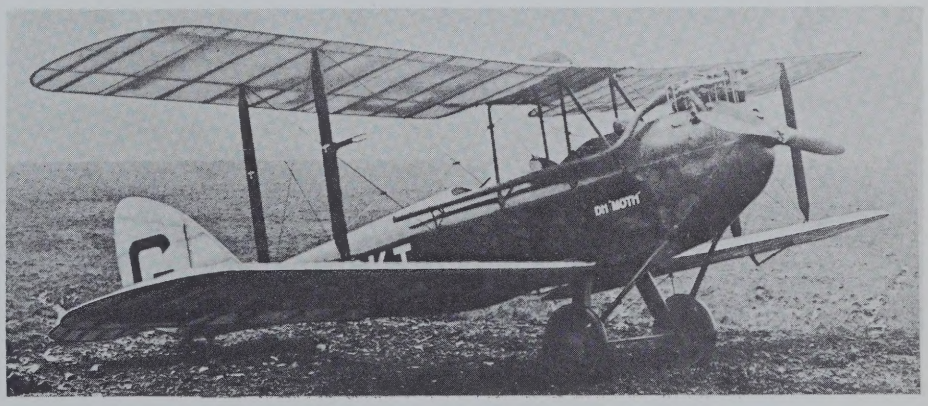
Captain Maxwell, one of the early pioneers in Canadian aviation, who organized the Ontario Provincial Air Service in 1924, was in England on an official mission for the Ontario Government. On a visit to Stag Lane Aerodrome he had seen a demonstration of the D.H. Cirrus Moth, and was highly impressed with the economic possibilities of this practical little light plane for fire detection duties over Ontario's forest areas.

His request for a demonstration of the plane's capabilities as a seaplane precipitated a hasty conference between de Havillands and Short Brothers at Rochester. Short Brothers agreed to co-operate and a Moth was hurriedly fitted with seaplane floats. Test pilot aboard, its engine ticking over, it now stood poised at the foot of the slipway awaiting the arrival of the visiting party. A "go-ahead" wave of the hand from St. Barbe to the pilot and a surge of power now sent the little ship skidding down the wet planks of the slipway and out into the choppy foam-specked waters of the Medway.

It was to be some years yet before the development of water rudders on seaplane floats, but the fine manoeuvring ability of the D.H. Moth as a seaplane was immediately apparent to all, as the pilot taxied out in the strong cross-wind and swung the ship around in circles of remarkably short radius with comparative ease. Finally, weather-cocking into the wind, he zoomed off the water and was soon circling over the tower of the ancient castle which for centuries has stood like a grim sentinel keeping watch over the little seaport town of Rochester.

The seaplane demonstration that day at Rochester was destined to become the opening scene in the de Havilland Canada story.

Captain Maxwell returned to Canada and succeeded in convincing the Honorable Wm. Finlayson — then Minister of Lands and Forests for the Ontario Government — that the D.H. Moth was the answer to Ontario's fire detection problems. It was the logical successor, he pointed out — costwise and otherwise — to the lumbering old H.S.2L flying boats which the Ontario Government had acquired from the U.S. Navy in the derelict-swapping era that succeeded World War I. Mr. Finlayson consented to authorize the purchase of four Cirrus Moths from de Havillands. That was the beginning of a long historical association between the Ontario Government and the de Havilland organization which, over the course of 25 eventful years, has been responsible for the development of many worthwhile contributions to the advancement of bush flying in Canada.



The Cirrus Moth, first plane assembled and delivered by DH Canada.

The impression Roy Maxwell had left behind in England with regard to the opportunities for aviation that Canada offered lingered in the imaginative mind of F. E. N. St. Barbe. Finally, intrigued by the picture that Maxwell had portrayed, he decided to come to Canada to see for himself how de Havillands could best participate in the young Dominion's expanding aviation development.

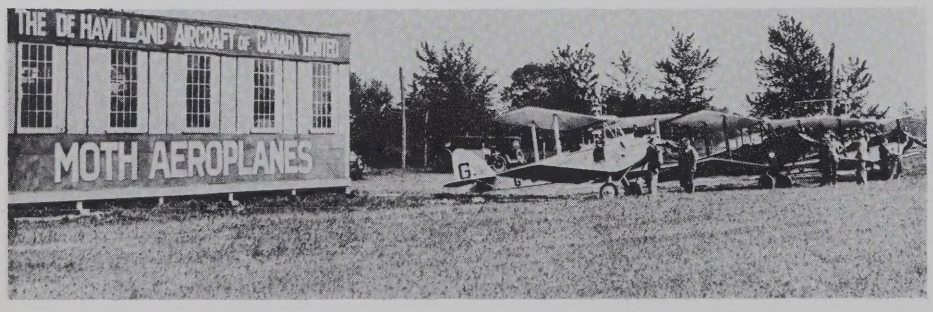
Urban Canada he found to be little more than a narrow fringe of civilization lying north of the Forty-Ninth Parallel. Beyond, a vast empire of solitude — more than three million square miles of primordial forest, valley and plain . . . the fabulous undeveloped North country. Here, he learned, was a great new land of opportunity on which the eyes of the world were beginning to turn. Already Canada's northern hinterland was contributing substantial wealth to the national economy in the form of fish, fur, and products of the forest. Sensational mineral discoveries had stirred the public's imagination, and money was pouring into the mining industry to stimulate the search for gold. The exploitation of our natural resources which has now reached such giant proportions, was beginning to roll back the frontiers. Men were trekking north in search of new horizons. Overland transportation was slow and laborious — in summer by canoe and "kicker," in winter by dog team, or the lumbering diesel-powered tractor trains that crawled like giant prehistoric caterpillars over the frozen trails. Canada's Northland was a vast expanse of sparsely populated territory served by hopeless transportation facilities. Its endless lakes and rivers, a formidable problem to the railroad builder, offered unlimited landing places for planes equipped with floats in summer and skis in winter. It was a situation that offered unlimited opportunities for the development of air transportation. So reasoned St. Barbe, and being an individual of much forceful purpose and few inhibitions, he promptly formulated plans for a de Havilland Canadian company.

Returning home he was successful in selling his idea to his fellow directors in England. A de Havilland overseas subsidiary had already been established in Australia and the Canadian organization

was to be patterned much along similar lines.

Canadian Emergence

In January, 1928, R. A. (Bob) Loader stepped off a train at Toronto's Union Station — his mission the formation of the new Canadian company. Alone in a strange land, he took a quick look around him to get his bearings, accustom his ears to the incongruous sound-effect of the North American influence on his mother tongue — and promptly set about his task with quiet, purposeful determination. His first move was the selection of one or two capable associates to assist him in his organization plans. In the legal organization of the company he was assisted by William Zimmerman of Toronto, a lawyer who became one of the first directors. Soon Mr. Loader was joined by A. C. Robins from England who was sent out as "Works Superintendent." Mr. Robins' title was indicative of the spirit of optimism which characterized the venture. The "Works" which he fell heir to with the title was a vacant shed on a railway siding in Mount Dennis, Ontario! With a consignment of Moths on its way out from England Bob Loader had been under some pressure to acquire the site in a hurry. It had several outstanding advantages. It was on a railway siding and the rent was dirt cheap. Even if it had not been on a railway siding, Mr. Loader would have taken it anyway. He took no little pride in the fact that the facade of the building was sufficiently spacious to permit the name of the product, "MOTH AEROPLANES," to be painted alongside the name of the company.



The first DH Canada "factory" at de Lessep's Field, Mount Dennis, 1928.

About this time, the first Canadian employee, Frank Warren (who is still with the company in the capacity of general foreman), joined the staff, bringing the working force up to a total of three. In March, 1928, the de Havilland Aircraft of Canada, Limited, commenced its corporate existence from very humble beginnings. A tiny wooden building, 40 ft. by 30 ft., served as the first assembly shed and flight hangar. This original "factory" building was erected on the country estate of Frank Trethewey at Mount Dennis, a suburb northwest of Toronto. Mr. Trethewey was an enthusiastic member of the newly formed Toronto Flying Club. His generous gesture made possible the first flying activities of the company.

The Canadianized postwar version of the Fox Moth proved a sturdy bush plane well suited to the rigorous requirements of North country flying.

Always a good friend of de Havillands, in the early thirties, he became definitely identified with the affairs of the company in the capacity of Chairman of the Board. The "aerodrome" was a piece of pasture land about 1,500 ft. long. In 1910 from that same spot Count De Lesseps had made the first airplane flight ever to be witnessed by citizens of Toronto. The name "De Lesseps Field" was bestowed on the place in honor of that occasion.

From the Beginning

The assembly of Moths shipped out from England commenced to get under way and Bob Loader decided to establish an office in the heart of downtown Toronto. About this time he engaged as his assistant, George Mickleborough — who became the second Canadian to join the organization. Mr. Mickleborough is today a Director and the company's Secretary-Treasurer. De Havilland Canada's first "office" was not the broadloom carpeted expanse of government-subsidized elegance that has become commonplace in the aviation industry in the present day and age. Bob Loader and George Mickleborough were both generously proportioned young men. They shared a table at which they sat diagonally opposite each other — with the office walls wrapped tightly round them. When one of them had to leave the office, whether for business or other equally pressing reasons, his co-worker would ooze out into the hall to permit him to squeeze by. If a prospective customer called to visit, say, Mr. Loader, Mr. Mickleborough would politely surrender his seat and carry his office work out into the corridor where he would continue his secretarial duties working up against the wall.

The "factory" presented some unique problems as well, due to limitations of both facilities and space. When the first damaged fuselage had to be re-covered, it was found that the overcrowded little workshop was hopelessly inadequate for doping operations. Mr. Trethewey was building an imposing new country home on his estate a short distance from the site of de Havilland Canada's activities. The fuselage, which required doping, was carried — much after the manner that a coffin in a funeral procession is borne — and passed through one of the windows into the billiard room of Mr. Trethewey's residence. Here the doping operations were carried out in an atmosphere of regal elegance, perhaps unsurpassed by that of any other dope shop anywhere in the industry.

The de Havilland Canada enterprise was a truly pioneering effort — the first aircraft business of any kind to become permanently established within the Dominion of Canada. The little group of doughty individuals who waged the struggle for its existence at this early stage of its career had courage, fortitude, and an enduring faith in the crazy notion that the airplane was here to stay. They had to have these attributes to survive. What the enterprise lacked in the way of capital and equipment they made up for in zeal, ardor, and enthusiasm.

With a little luck and a lot of work and effort, the new venture took root and succeeded. Sixty-two Moths were delivered in the first year. The tiny shed at Mount Dennis was soon bursting at the seams, and a new plant was erected on a 70-acre tract at Downsview, Ontario. This was in September, 1929.

Canada and D.H. Expand

The company kept pace with the rising tide of aviation expansion in Canada, and continued to grow and expand. New names appeared on the payrolls — names of personalities that became a vital part of the Canadian aviation scene. Leigh Capreol served as the company's first test pilot. Typical of the spirit that inspired the personnel at this time, Leigh went out and earned a very useful $2,000 for the struggling young company by staging an aerobatic display at the Canadian National Exhibition. W. R. (Bill) Calder joined the company in 1929. With the company 24 years in a technical capacity, he is widely known from coast to coast in aviation circles. He is still with the company in the capacity of service manager. Genial, personable Geoff O'Brian joined the staff as sales manager in 1930. To publicize the company's products he made a memorable flight in a Puss Moth from Toronto to Vancouver and return that same year. Accompanied by George Mickleborough of the business office, he accomplished the 6,050-mile journey in 57 hours flying time. Bob Loader was succeeded by Lee Murray as manager in 1933. The staff of the company had by this time risen to a total of 80.

These were the years when the first generation of bush pilots were writing a stirring new chapter of aviation history in the vast, unexplored territories of the north. It was a chapter of dramatic, swift-moving conquest that had few parallels. Mining men, with tireless perseverance and the courage of their convictions, had dug deep into the face of the great pre-Cambrian Shield to prove that under that massive visage of imperturbable rock there lay a heart of gold. The mining boom — which cushioned the gloom of the world depression years for Canada — was commencing to set the stage for a great new era of widening horizons of vanishing frontiers. Incredible new mining "strikes" were quickening the pulse of investors and prospectors alike. A great cavalcade of flannel-shirted, hobnail-booted men was on the move — surging north in search of the rainbow's end.

The race was to the swift, and ground transportation was tediously slow. The airplane was seized upon as the answer to the prospector's urge to get where he was going in a hurry. To him this swift-winged argosy of the northern skies meant the end of journey's toil. Air bases commenced to dot the railhead jumping-off places in ever-increasing numbers across the continent-wide expanse of the mining front. The rising flood tide of fortune that swept the mining industry from an awakening consciousness in 1924-5 to the proportions of a boom, brought ever-multiplying fleets of planes swarming into the north. It was a golden epoch of romance and adventure which set those age-long silent abodes of solitude echoing and re-echoing to the drone of a new, swift, powerful presence in the skies.

Canadian pilots in that dramatic, nation-building era of expansion mastered the technicalities of a totally new trade — the art of bush flying. In planes that knew no shelter from either the midsummer's blazing sun, or from winter's icy breath, they pushed aerial exploration clear up and across the lonely wastes of the Arctic. They were pioneers in the field of heavy freight transportation by air, and year after year established new world records for tonnage of air cargo flown.

The D.H. 82C, or better known as the Tiger Moth, was first built in 1931. It achieved great success as a primary trainer in Canada during World War II and was actually armed as a light bomber during the black days of 1940 to help repel any invasion attempt of England.

D.H. and the "Bush"

During the years of which we speak, the de Havilland organization assumed a definite role in the development of aviation in Canada. Although its status was that of a branch factory for the assembly of the parent company's products, it early developed leadership in the design of sea-plane floats and winter ski installations . . . of special built-in provisions for the handling of heavy freight . . . and many of the unique features which have come to distinguish Canadian bush airplanes from those of any other breed.

Philip C. Garratt, the present Vice-President and Managing Director, succeeded Lee Murray as manager in 1936. Phil Garratt started flying in 1915 when he was 21 and has been flying ever since. Today he is the pardonably proud possessor of a Beaver of his own which he uses constantly for both business and pleasure travel. Several years ago, in 1947, while on a visit to England, he flew a Vampire jet fighter and thereby became the first grandfather on record to qualify as a jet fighter pilot.

Prior to joining the company, Phil Garratt did test flying for the struggling young enterprise — mostly "just for the fun of it." He frequently volunteered to ferry new planes for the de Havilland people simply because he loved flying. In 1936, when he was offered the management of the company, without a moment's hesitation he wound up his own business and applied his full-time energies to the business of planning, building and flying airplanes, a labor of love that was to shape the pattern for a highly successful career.

In a lifetime devoted to aviation, Phil Garratt has set an enviable record of Canadian achievement. With a singular tenacity of purpose, he has kept the Canadian company which he heads solvent through good times and bad. It is the only Canadian aircraft manufacturing enterprise which has managed to survive nearly three decades which have included the pre-war depression and the postwar struggle for existence in their span. For his life-long

active interest in flying, and his outstanding qualities of business foresight, knowledge and leadership, Philip C. Garratt was awarded the McKee Trophy — symbolic of the outstanding contribution to aviation in Canada — for the year 1951.

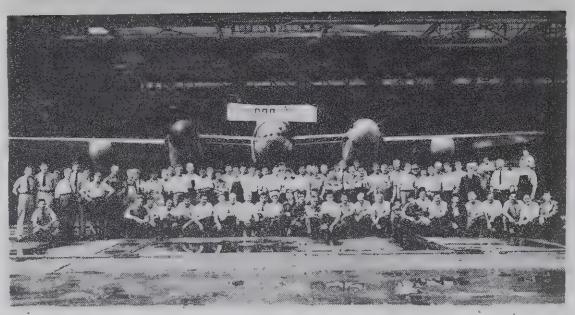
On assuming the management of the de Havilland Aircraft of Canada, Limited, Mr. Garratt was quick to recognize the need in this country for airplanes that could operate on floats and skis to speed the work of progress and development that was taking place in the north.

To the work that had already been accomplished by the company in adapting the Moth 60, DH61 and the Fox Moth to floats, Mr. Garratt added his pilot's background of experience. Under his direction the Dragonfly and Dragon Rapide underwent extensive modifications and emerged as "beefed-up" bush planes, sturdy and rugged, and boasting many features to add to their usefulness from the Canadian northcountry operator's point of view. The Dragon Rapide proved one of the most successful machines from an economical aspect to ever make its appearance in Canada. It was widely used on scheduled services by Canadian Pacific Airlines, Quebec Airways Ltd., Maritime Central Airways Ltd., and many charter operators — for all of whom it paid off handsomely in lush net operating returns.

Foresight and Perseverance

In 1937 the need for aggressive rearmament became alarmingly apparent within the democratic nations. The de Havilland Tiger Moth had been developed into a highly successful training plane and had been extensively modified by the Canadian organization to meet the specific requirements of the Royal Canadian Air Force. Mr. Garratt concluded, reasonably enough, that he headed up an organization particularly well qualified to supply the pressing need for training planes. With typical Garratt tenacity he journeyed many, many times to Ottawa in a dogged effort to get that idea across. Finally, in 1937, he received an order for 25 Tiger Moths from the Canadian defense authorities, and the next year an order from the British Government for 200 Tiger Moth fuselages and components for the RAF. These were manufactured by the Canadian organization and shipped to the parent company in England for assembly — a complete reversal of the processes which had formerly established the flow-pattern between the organizations.

War clouds continued to gather abroad. Tense, anxious months of uncertainty passed. Finally, in 1939, Phil Garratt was faced with the stern task of mobilizing the human and mechanical resources at his disposal for the grim, eventful years that followed the outbreak of war. By this time he had delivered all the Tiger Moths on order and found himself in the ironical position of having an idle airplane factory on his hands at a time when the great German war machine was being massed for the lightning blitz that almost succeeded in annihilating the democratic world!



The 1000th Mosquito produced by D.H. Canada and some of the people associated with the manufacture of this famous World War II Aircraft.

Phil Garratt pleaded for orders to get his idle factory rolling on the war production effort which he knew it was capable of. By cutting back his working force he managed to hang on financially during a trying six months' period of stagnation. Meanwhile, he continually pressed for the green light that would put the de Havilland organization on a full-out war production basis — and risked complete financial ruin to provision for engines and material that he estimated would be needed. His persistent efforts were finally rewarded in February, 1940, with an order from the Joint Air Training Plan for 404 Tiger Moths. The foresight he had shown enabled deliveries to commence almost immediately.

The aircraft produced was known as the DH 82C. The "C" attested the fact that the ship had undergone sufficient modification at the hands of the Toronto organization to establish its Canadian citizenship. It had acquired float and ski fittings, a coupe top, cockpit heater, newly-designed engine cowling, a tail-wheel and an increase in power. The suffix "C" symbolized the coming of age of the Canadian organization. From this humble beginning in the field of creative engineering effort developed the team responsible for three spectacularly successful Canadian designs — the "Chipmunk," the "Beaver" and the "Otter."

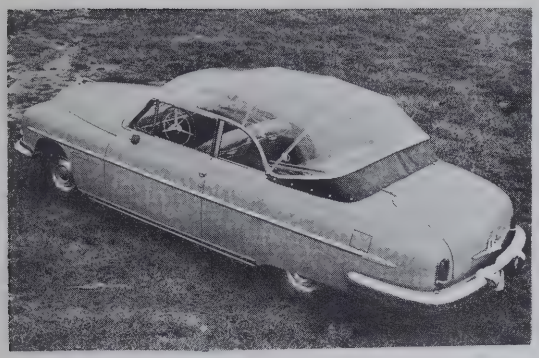
The 1000th Chipmunk produced by de Havilland England. This was the first aircraft design to be "exported" from Canada to England.

The demand for wartime training aircraft kept de Havillands going at top speed on Tiger Moth production. Altogether a total of 1,747 were produced. In 1940 the company received a contract to assemble Ansons, 375 of which rolled off the assembly lines of the Toronto plant. Canada had now assumed the full responsibilities of a world power and became a vast arsenal for the supply of vital material to feed the Allied war machine. The pressure was on the aircraft industry for production, production and still more production. De Havilland Canada was faced with herculean problems of expansion. From a payroll of less than 50 people when the first Tiger Moth contract reached P. C. Garratt's desk, the wartime organization was pyramided up to a maximum of 7,200 at its peak. The plant increased from an area of 10,000 feet at the beginning to the group of modern buildings which now sprawls over an area of 12½ acres.

In 1941 the company commenced to tool up to produce Mosquitos. W. D. Hunter of the parent company flew to Canada to organize the engineering side of the Mosquito program. He has remained with the company since as Director of Engineering. Within a year, in September, 1942, the first Canadian-built Mosquito rolled off the production lines and was put through its paces by Chief Test Pilot Ralph Spradbrow. It was the forerunner of the great cavalcade of 1135 of these machines that were turned out by the organization before the end of the war. At its peak the company was rolling Mosquitos off its production lines at a rate of 120 a month.

Post-War Adjustment

The war over, demobilization of a vastly expanded war industry brought the inevitable period of adjustment with its endless world-wide confusion and disruption. P. C. Garratt, however, lost no time in reorganizing postwar de Havilland Canada. In a modest corner of the great wartime premises a small hand-picked staff of employees commenced production of the DH83C — a Canadianized version of the popular prewar Fox Moth. These useful little bush airplanes were fabricated largely out of war-surplus Tiger Moth



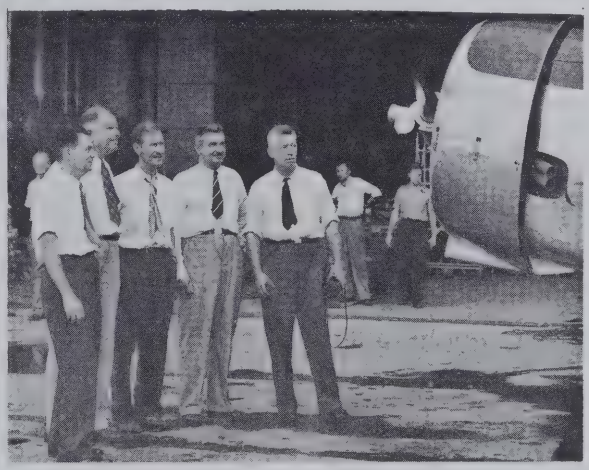
The transparent canopy especially designed and manufactured by D.H. Canada in one week-end, for the visit of Queen Elizabeth II and the Duke of Edinburgh in 1951. The automobile industry said it couldn't be done!

components which were readily at hand. More than 50 were produced and sold.

In May, 1946, Wing Commander Russell Bannock, DSO, DFC, on completion of a distinguished war record in World War II, joined the company as Chief Test Pilot and Military Sales Manager. In 1950 he was appointed to the board as Director of Operations. During his service overseas Russ Bannock flew de Havilland Mosquitos on night intruder combat missions. In all he shot down 14 enemy planes in action — an amazing record for night flying operations. He was credited with destroying 20 German V-bombs, the highest score of these fast flying missiles accounted for by any pilot during the war. He has contributed to the Canadian company not only the benefit of a broad background of military flying experience, but an extensive knowledge of technical matters and a keen interest in sales.

DH Canada had concentrated heavily on the production of training aircraft during the early stages of the war, and out of that experience had come a wealth of knowledge pertaining to the rudimentary requirements of training aircraft design. Early in 1946 the engineering staff commenced to concentrate its efforts on the design of a new basic trainer which was to be the modern successor of the famous Tiger Moth — the Chipmunk. Under the guiding hand of Pat Fillingham, the prototype made its first flight in May, 1946. The Canadian-designed Chipmunk immediately found favor with air forces in many parts of the world. Chipmunks were exported in quantities to India, Iraq, Thailand, Egypt and many other lands. In all, 158 of these aircraft were delivered. In December, 1951, Chipmunk manufacture in the Canadian factory had to be discontinued to concentrate the company's entire production facilities on U.S. defense orders. However, the Chipmunk meanwhile had been adopted by the Royal Air Force for its reserve officer training requirements and the parent company in England placed it in mass production for the RAF and for a ready export market that has expanded to encompass half the globe. In 1956, the 1000th Chipmunk rolled off the assembly lines of the de Havilland organization abroad. When the Duke of Edinburgh decided to enter aviation, it was the Chipmunk that was chosen for his flying instruction.

For many years Canadian pilots had dreamed of the ideal bush airplane — one that would be built for the Canadian operator's requirements right from the first line on the drawing board to the final assembly line. Bush airplanes in the past had been imported products, mostly, modified to some extent to meet Canadian requirements but, by and large, leaving much to be desired from the northcountry operator's point of view. Early in 1946, Frank MacDougall, Deputy Minister of Lands and Forests, and George Ponsford, Director of Air Services, intimated that the Ontario Government would be in the market for a good bush airplane to replace the fleet of obsolete forestry planes it was then operating. This influenced the company's decision to proceed with the design of an airplane that would have everything the northcountry operator had ever dreamed about. Bush pilots were canvassed from coast to coast and invited to submit their recommendations. These tallied very closely with the company's own thinking.



A representative group of Canada's veteran Bush Pilots view the aeroplane designed and built to their own specifications. (L to R) C. H. (Punch) Dickins, P. C. (Phil) Garratt, A. F. (Sandy) MacDonald, the late T. M. (Pat) Reid, Frank McDougall.

In 1947 one of Canada's most famous bush pilots, C. H. "Punch" Dickins, formerly Vice-President and General Manager of Canadian Pacific Airlines, was added to the board of management in the capacity of Director of Sales. As a fighter pilot in World War I, "Punch" accounted for seven enemy planes and was awarded the D.F.C. In 1928 he was presented with the McKee Trophy for his outstanding contributions to the advancement of aviation in Canada. In 1935 his spectacular achievements in bush flying received further recognition with the award of the O.B.E. At Montebello, Quebec, in 1952 he was elected president of the Air Industries and Transport Association of Canada. These signal honors and distinctions mark the highlights of a career that has been steadfastly devoted to aviation and to the acquisition of a great fund of knowledge which has proved of inestimable value to the organizations which he has served and the land in which he lives.

Realization of a Dream

The bush-flying know-how of veteran pilots such as Garratt and Dickins was combined with the combined opinions of northcountry pilots from coast to coast who had been invited to contribute their ideas on the requirements of the ideal bush airplane. With characteristic thoroughness, Phil Garratt incorporated the data he had in hand into a composite specification which was the work sheet he handed to his design staff with instructions to go full-speed-ahead on the design of the Beaver. A "native son" in every sense of the word, the prototype Beaver was rolled out for its initial test flight by Chief Test Pilot Russ Bannock in August, 1947. In the listless heat of a midsummer afternoon, the Beaver thrilled its builders and designers alike with the first of those sensational take-offs which still amaze observers wherever Beavers are flown. In the USAF they tell a story which aptly epitomizes the Beaver's unusual ability to get in and out of uncomfortably tight places. It concerns a Bomber Command pilot en route from a Pacific Coast Air Base to Alaska. Somewhere up over the British Columbia hinterland this perfectly well-meaning good samaritan sent out an "urgency" call on his radio. A Beaver was down in a hopelessly-tiny pot hole and looked as though it needed some help, he transmitted. A reply came back from one of the

Mr. P. C. Garratt and Major General Mark E. Bradley, Jr., U.S.A.F. on the occasion of the completion of the first L-20 for delivery to the United States Air Force.

The Beaver, designated the L-20 in the U.S. Air Force and Army, saw extensive service in Korea, and is flying in over 52 countries in the world.

Successful operations are carried on under the most extreme conditions of Northern weather.

stations which had intercepted the message. "Hold everything, Lieutenant," it stated, "That's one of our forestry planes — and it's operating out of its regular base!"

It was historically significant that the Ontario Government, whose purchase of Cirrus Moths in 1927, had provided the initial inspiration for the birth of the Canadian enterprise, lent both moral and financial encouragement to the creation of the Beaver 20 years later, in 1947, by placing an initial order for four. The Department of Lands and Forests today operates a fleet of no less than 40 Beavers, which, incidentally, is the largest fleet of

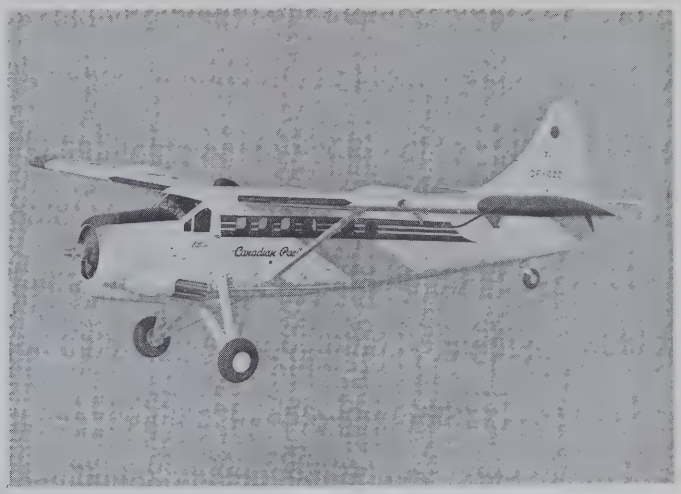
Formerly inaccessible small-lake areas are easily and regularly supplied by Beaver seaplanes.

The Amphibian combines all the best features of the Beaver landplane and seaplane adding versatility to operations.

airplanes operated by any forest service the world over.

In 1949 the Beaver was demonstrated to the U.S. Search and Rescue Command in Alaska. It was selected by Colonel Bernt Balchen, one of the greatest Arctic fliers of all time, as the one aircraft that could fully meet all the exacting requirements of the USAF in that sphere of operation. A requisition went forward to Washington for the purchase of 22 Beavers. It was shelved by the "Buy America Act," a piece of legislation that prohibited the purchase of peacetime military equipment beyond the borders of the continental

The Otter carries greater payload but maintains the outstanding performance features of the Beaver.



Equally versatile the Otter is available as a land, sea or ski pla.ie or combinations of wheel-skis or wheel-floats.

U.S.A. The incident made international headlines at the time.

In the spring of 1951, the Beaver was entered in a competition held jointly by the U.S. Air Force and Army for the selection of a liaison aircraft at Dayton Field, Ohio, and Fort Bragg, North Carolina. Six other aircraft competed. The Beaver won the competition by a wide margin and was designated the L.20 by the United States Armed Forces. A substantial contract for L.20 deliveries was awarded to the company by U.S. defense authorities, the first ever placed outside the borders of the U.S.A. in peacetime. Although the delivery schedule left little time for tooling,

Longer range, greater payload of the Otter have extended the borders of the Canadian North.

Built to endure extreme sub-zero temperatures, the Otter proved invaluable in the Antarctic with the U.S. Navy expedition.

expansion and provisioning for such a heavy production program, DH Canada's production team delivered the first unit on schedule and has continued to deliver every L.20 since without a single hour's delay.

In Korea the Beaver L.20 was known as the "General's Jeep." It was used by Generals Van Fleet, Ridgeway, Mark Clark and other U.S. senior ranking officers when they wished to visit front-line positions. The L.20 was the command transport chosen for President Eisenhower's use when he visited the combat zones in Korea in 1953.

In addition to transporting high-

ranking officers on appointed rounds, the L.20 proved of inestimable value to the U.S. Army in Korea in the movement of men and supplies into forward areas and the evacuation of wounded. In one case, an L.20 evacuated 200 casualties out of a combat zone in a three-week period.

Security measures do not permit the publication of any figures in connection with the L.20 production program. However, up to October, 1956, a total of 1000 Beavers of all classifications had been built and sold. "Eager Beavers" are now performing a wide variety of useful tasks on seven continents and in more than 52 different countries throughout the world.

Mr. Garratt and his associates had taken a million-dollar gamble when they decided to go ahead with the design of the Beaver. It was a gamble that paid off. Encouraged by the world-wide success the Beaver had achieved, they began to develop the idea of a "Big Beaver." The need, freely expressed by the RCAF, for an Arctic search and rescue plane with greater payload and range than the Beaver, added impetus to DH Canada's thinking. Late in 1950 their plans had developed to a point which could definitely be set down in the form of a specification. It was to be an airplane with the performance of a Beaver — but double the Beaver's capacity and payload! That was an ambitious design project to ask any engineering staff to usher into the world, but in January, 1951, the de Havilland Canada design team took the job in hand as a matter of de Havilland routine. On December 12, 1951, Chief Test Pilot George Neal taxied the Otter out on the runway at Downsview — and took off on the same 600-foot stretch of runway that the Beaver uses to get airborne! Soon afterward, the first official public demonstration of the Otter was staged at Downsview. In the presence of a select gathering of distinguished visitors, the Otter was run through its demonstration routine. It turned in a performance that left no doubt in anyone's mind that the Otter was here to stay.

Already in full-scale production for both RCAF and civil requirements, the Otter proved another highly successful financial venture on DH Canada's part — one that is contributing materially to Canada's national development and adding substantially to the volume of our foreign trade.

Production of Otters for the RCAF began in 1953. Today, RCAF Otters, stationed from coast to coast, are performing a wide variety of useful duties, among the more spectacular of which have been a number of outstanding rescue missions in the Far North. In 1954 the Norwegian Air Force adopted the Otter for operational duties over the rugged subarctic terrain of the Scandinavian Peninsula. In 1953 the United States Army

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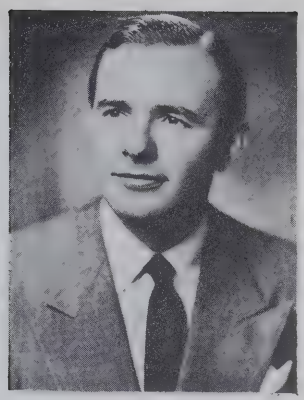


R. Bannock, D.S.O., D.F.C.
Operations Director

P. C. Garratt
Vice-Pres., Managing Director

C. H. Dickins, O.B.E., D.F.C.
Sales Director

W. D. Hunter
Engineering Director

W. W. Parry, Q.C.
Director

staged an exercise labelled "Operation Skydrop" at Fort Bragg, North Carolina. Operation Skydrop was an operational test to evaluate the comparative efficiency of rotary vs. fixed wing aircraft.

The Otter took part in competition with several different types of helicopters. During one of the tests, on a particularly oppressive Carolina midsummer afternoon, the Otter astonished all the observers present at the time by beating the take-off distance of a helicopter of identical power over a 50-foot obstacle — while carrying double the helicopter's load! That, plus the all-round performance characteristics which the Otter demonstrated during the trials, paved the way for an Otter procurement programme for the U.S. Army. In 1955 the company received an order for 95 Otters, and on March 14, 1955 another great milestone in de Havilland Canada history was passed when General Louis W. Prentiss accepted delivery of the first Otter on behalf of the United States Government. In terms of U.S. military enumeration the Otter has been officially recognized as the pioneer aircraft in its class (utility) and has been designated the U1-A. More familiarly, it is known as the "airborne one ton truck of the U.S. Army". Indicative of the Otter's ability to operate in extremes of climate found anywhere under the sun, is the significant fact that the first six Otters delivered to the U.S. Army saw service along the Arctic coast line of Alaska, while the next six were allocated to duties in the Panama Canal Zone.

In 1955 the Otter added the insignia of the U.S. Navy to the many military identification symbols which it has borne. An initial assignment of 4 Navy Otters, despatched to the Antarctic on "Operation Deep-freeze" in July of that year, were followed by an additional quota of nine to take part in similar geophysical exercises in Antarctica in 1956.

On the civil side, the Otter gained instant acceptance on the part of air operators throughout the world as readily as had the Beaver following its introduction 5 years before the Otter's time. Otters are today supplying the need for a wide variety of flying services in practically every corner of the Globe. Unique among them, perhaps, is the utilization of Otters on its regular scheduled passenger services by Philippine Air Lines. Following a world-wide survey, the Otter was selected as the only aircraft capable of operating from tiny jungle landing strips, too small for multi-engine aircraft to use. The fact that rates had to be governed by a peon public's ability to pay, rendered the helicopter impractical from an economic point of view.

A sign erected at the entrance to one of Philippine Air Lines jungle flag stops describes the Otter as "COMFORTABLE TO RIDE BUT BUILT LIKE A TRUCK".

1956 was to prove a year of record expansion for de Havilland of Canada. Expansive development of the tremendous oil and gas resources of the Western Provinces, coupled with fabulous new discoveries of copper, nickel, and uranium ore in base metal mining camps from coast to coast, had sent the wheel of fortune spinning in Canada's direction. A rising flood tide of new capital for investment, pouring in from the great financial centres of the World, had set the stage for an era of expansion, exploration and development within the far flung boundaries of this lusty young nation which was to reach unprecedented proportions. De Havilland Canada, whose affairs throughout the years had reflected the nation's fortunes as a whole, experienced a pronounced acceleration in the demand for its products and its services. Beaver and Otter orders, pouring in in ever-increasing volume, made a substantial step-up in civil aircraft production a must. To meet an RCAF pilot training requirement, Chipmunk production, surrendered to the British Company in 1951, was reactivated at the de Havilland Downsview factory again in 1955. In 1954 the company was awarded a contract to build the Grumman CS2F-1 carrier-based, anti-submarine type aircraft in quantity for the Royal Canadian Navy. Tooling and pre-production planning occupied 20 months, and in August 1956 the first of one hundred of these formidable Navy craft commenced to roll off the assembly lines.

The engine shop, which, since the establishment of the post-war company in 1946, had experienced a steady increase in its engine overhaul activities, was expanded in 1954. It is now housed in a separate factory building 92,400 square feet in area, and has built-up facilities capable of overhauling all types of piston and gas turbine engines, and propellers on a quantity basis.

A Guided Missile Division was set up in 1954. The work of this Division is of a highly classified nature, but it has made some noteworthy contributions to this new branch of military warfare since its establishment within the framework of the de Havilland Canada organization.

Early in 1955 the company had concluded that the local air service operators and the armies of the world were ready for a multi-engine STOL utility-type transport airplane—one that could haul mixed loads of passengers and cargo, go

Far away from its birth place, a Beaver aircraft is employed by the Central African Airways to carry mail and passengers to remote areas of the "Dark Continent".

Otters have been in service with the R.C.A.F. since 1953 in a variety of roles, one of the most important of which is Search and Rescue operations across Canada and up into the Arctic areas.

places on one engine, and be able to operate out of a 5-acre field with room to spare. Original thinking came up with the idea of a "twin-engine Otter", designed around the Otter's two 600 bhp engines, having a fixed landing gear and a gross weight of around 13,000 lbs. But when CAR-4B transport category licensing requirements had to be realized, the poor little twin Otter died on the drawing boards. It didn't boast much more payload than its single-engine counterpart.

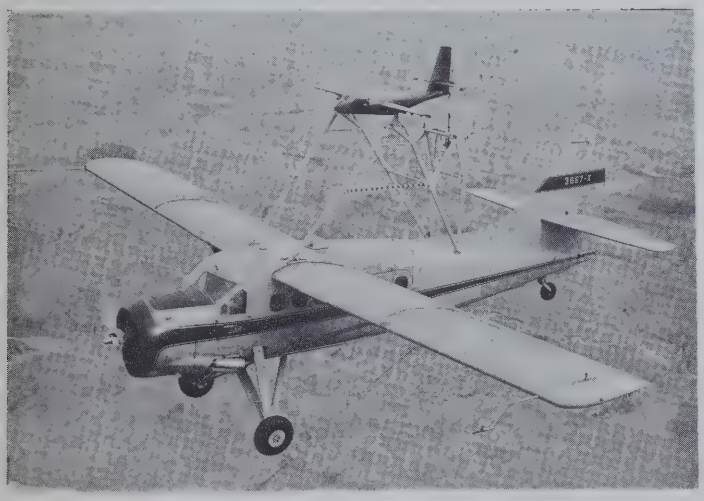
The Caribou Emerges

Successive design studies pushed the twin-engine STOL concept weight up to 22,000 lbs., to 24,000 lbs., and finally to 26,000 lbs. Power requirements escaladed from engines of 600 to 1200 bhp, and eventually finalized in the selection of 1450 hp Pratt & Whitney R2000's. These were found after two years of intensive design studies to be minimum requirements for a twin-engine transport airplane that could meet CAR-4B requirements for single-engine operation and still achieve better than average operating economy.

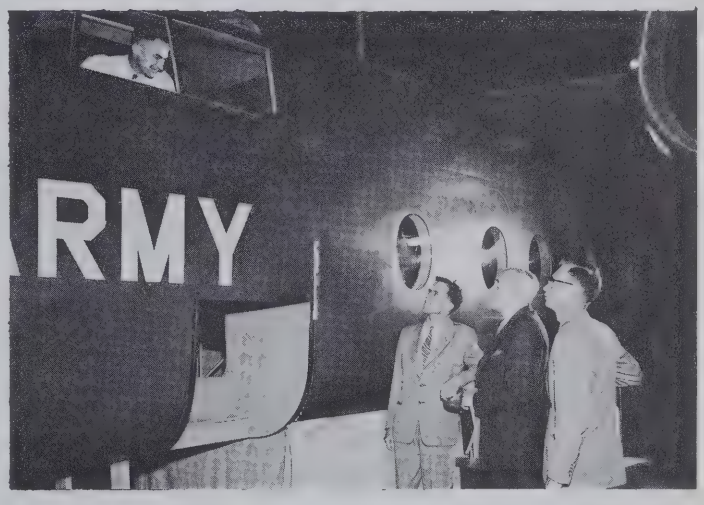
Philip C. Garratt's love of wild life is reflected in the names de Havilland Canada's airplanes bear. First came the Chipmunk, then the Beaver, and next the Otter—all owing their birthright to the denizens of Canada's forests whom de Havilland Canada's Managing Director had come to know and love so well. Following established de Havilland Canada tradition, the new prototype was christened the DHC4 "Caribou."

The "utility" aircraft, as defined by DHC engineers, is one designed to operate in undeveloped areas where airports are unknown and maintenance facilities are few and far between. The utility aircraft must be simple, rugged and easy to maintain under the most primitive conditions. Since the operator frequently has to build and maintain his own landing strips, emphasis on short-field performance is heavily underlined.

In the design and development of the Caribou, the requirements of the feeder line operator were kept constantly in view. During the early formative stages of development, however, it was apparent that a STOL transport airplane of this type would prove ideally suitable as a close support plane for armies in the field. Discussions with military experts both at home and abroad dictated that a large rear loading door was a "must". With this requirement, the formula for the design of the new model became pretty well resolved. The size and shape of the STOL Caribou began to take definite form.



Using an Otter as a flying test-bed for the Caribou eliminated many of the normal wind tunnel tests necessary in the development of a new design. The "piggy-back" technique developed by DHC made aerodynamic measurements possible in "free flight".



In the mock-up stage of development in 1957, the Caribou is taking shape in the hands of its design team L. to R.: G. Neal, Chief Test Pilot, R. D. Hiscocks, Assistant Chief Engineer, W. D. Hunter, Engineering Director and F. Buller, Chief Design Engineer.

The final decision to go ahead with the production of the Caribou in the latter part of 1956 was triggered by an offer from the Canadian Government to advance 2½ million dollars towards the development. The sizable balance of some 26 million dollars required to bring the Caribou into the world was yet another and even more ambitious private capital venture on the part of P. C. Garratt and his Directors.

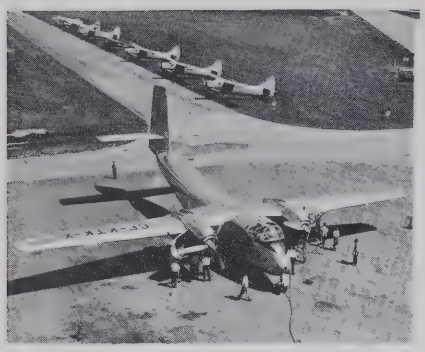
On the morning of July 30, at Downsview, a group of eager men in their shirtsleeves, the Caribou design team, moved along the taxi strip towards the intersection, and thence to vantage points along the runway boundaries to witness the enactment of yet another signal event in de Havilland Canada history, the roll-out flight of the Caribou prototype. Against a bright blue midsummer sky, flecked with billowy cumulus clouds, the glistening silver ship, under the guiding hand of Chief Test Pilot George Neal and Co-Captain Dave Fairbanks, at 08:46 EDT, taxied to the end of the runway for the cockpit check, was cleared to position for take-off and, in less than 300 feet of runway space, took off on a maiden flight that was to be logged as a perfect test performance.

Precedents Are Broken

Early in 1957 the United States Army had indicated a serious interest in the Caribou, and, about midsummer of that same year, offered to purchase five aircraft for evaluation purposes. The company agreed to deliver five early production models on an "off-the-shelf" basis for a firm price of 2½ million dollars.

As far as is known, the Beaver was the first foreign aircraft on record to enjoy the unique distinction of being introduced into the United States of America by an Act of Congress. The "Buy America" Act was by-passed to permit the purchase of Beavers outside the borders of the U.S.A. by the American military authorities. The Caribou, in turn, was also to shatter a precedent, the ruling which limited the United States Army to the operation of aircraft of not over 5000 lbs. basic weight. The regulation was waived to permit the purchase of the DHC4 Caribou, whose gross weight totals 26,000 lbs. and whose basic weight can exceed 18,000 lbs.

The UI-A Otter had become the first of a new type-category aircraft on the U.S. Army inventory (Utility), and now the Caribou was also to pioneer a new



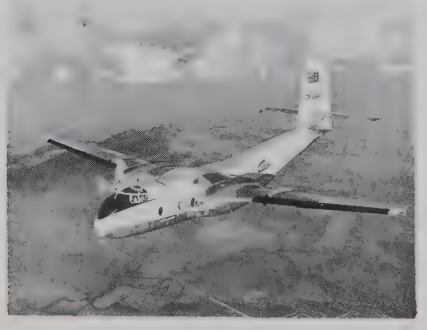
The prototype Caribou KTK is given a final, thorough "going over" prior to its maiden flight.

classification—the "Air Cargo" category. The Caribou has been officially designated in U.S. military nomenclature as the AC-1.

On October 8th, 1959, in the presence of top ranking military leaders from both the American and Canadian Armed Forces, government aviation experts, and a distinguished group of civil aviation executives and technologists, Lieutenant-General Arthur G. Trudeau, Army Chief of Research and Development, in a brief but impressive ceremony, accepted delivery of the first AC-1 Caribou aircraft on behalf of the United States Army.

The de Havilland organization meanwhile had conducted an exhaustive survey through its associated companies, area managers and sales agents throughout the world, and was convinced that an excellent potential civil market existed for the aircraft—particularly in some of the less developed areas of Latin America, Africa, the Middle East and the Far East. The management therefore decided to proceed straight-away with production tooling, and issued a production order for the first batch of 20 aircraft, on which production got under way in January, 1958.

On October 22nd, 1959, a Caribou took off from Downsview Airport on a globe-girdling thirty-five-thousand-mile demonstration tour lasting four months, and visiting 47 foreign cities en route.



"Caribou International" on a world demonstration tour, is shown in flight over England in late 1959.

The "Caribou Trail" led across the South Atlantic via the Azores to Great Britain, shuttled across Central Europe, traversed North Africa, and rolled on across South Asia, the Middle East, the South Pacific and the Far East. Journey's end was not logged until the final arrival of the travel-weary demonstration team at Sydney Airport, "down under."

The flight was to prove the Caribou's ability to pioneer a new era of progress and expansion for some of the more remote regions of the Eastern Hemisphere—whose full potential economic development has suffered for lack of adequate communication and transportation services.

The handing over of the first Caribou to the U.S. Army took place on October 8, 1959. Visiting dignitaries shown with Mr. P. C. Garratt included L. to R.: Lt. Gen. A. G. Trudeau, Sir Aubrey Burke and Maj. Gen. J. V. Allard.

The de Havilland Aircraft of Canada today ranks as the oldest established aircraft manufacturing industry in the Dominion. The turn of the quarter century in the Company's affairs came in 1953. By a happy coincidence, in its 25th anniversary year, the company had held open house in its big new ultra-modern factory building—then in the course of construction on a 95-acre tract of land in the southwest corner of Downsview Airport. Mr. Garratt and his associates, playing host to Sir Geoffrey de Havilland, founder of the de Havilland World Enterprise, on that occasion could well view with pride this crowning achievement—the last word in modern aircraft factory construction—colossal enough in

July 30, 1958, another Memorable Day for DHC as the prototype comes in for a landing.

size they estimated to take care of de Havilland Canada's expanding needs for the next quarter century that lay ahead.

By 1955 the big new plant that was built to take care of future needs was bursting at the seams! A 31,875 square foot stores addition had been added, and in 1956 the Grumman production programme, the Guided Missile Division, and several overcrowded departments were moved to the old North plant, which the company had formerly occupied, to relieve the growing pains.

The 4000-odd workers who today man the assembly lines of this highly productive industrial machine may well view with respect the eventful years of struggle and effort, and persevering toil that have been woven into the fabric of their own historical background. There was many an anxious day in de Havilland Canada history when the Management's ability to meet its weekly payroll hinged on the down payment on a Fox Moth, or a fortuitous error in judgment that put an RCAF Tiger Moth trainer over on its back—and into the repair shop.

In a changing world of conflicting ideologies, de Havilland Canada—like the great World Enterprise to which it owes its origin—stands out as one of the most salient examples of free enterprise that can be found anywhere within the aviation industry in the entire freedom-loving world.

The DHC-4 Caribou became the AC-1 in the U.S. Army with the first deliveries in October, 1959.

DE HAVILLAND AIRCRAFT

From the Tropics to both Poles

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Wardair Ltd.
Yellowknife, N.W.T. Canada

SOUTH

Taxi Aereo de Santander Ltda.
Bogota, Columbia, S.A.

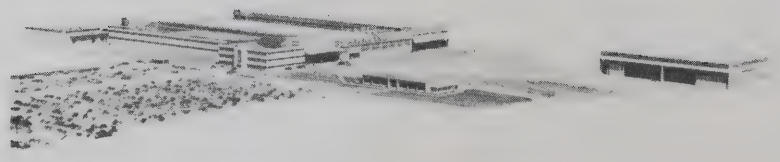
From the D. H. assembly lines

EAST

Arabian-American Oil Company
Saudi, Arabia.

WEST

Pacific Western Airlines
Vancouver, B.C.
(Beaver No. 1)



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Western Sales and Service: Edmonton, Alta. • Pacific Coast Sales and Service: Vancouver, B.C.

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GREATER PAYLOAD — Carries 20 Passengers or 5200 lb. (2360 kg.).

HIGHER SPEED — Cruises at 182 knots (337 km./hr.) at 10,000 ft.

LONGER RANGE — 950 nautical miles (1760 km.) range with optional wing tanks.

INCREASED POWER — Reliable Pratt and Whitney PT6A-27 engines rated at 620 SHP at temperatures up to 91°F (33°C).

AIRLINE COMFORT — Quieter cabin with a new interior styling with more comfortable seats, individually-controlled reading lights and air vents.

GREATER SAFETY — The Twin Otter is certified in the normal category (CAR-3) by the Canadian Department of Transport (Aircraft Type Approval A-82) and by the United States Federal Aviation Administration (Type Certificate A9-EA). In addition the Series 300 meets the U.S. Special Federal Aviation Regulation No. 23 which establishes additional airworthiness standards for emergency evacuation, systems design and aircraft operation. Optional installations are available for compliance with British ARB and Australian DCA requirements.

LONGER LIFE — A more rugged structure, improved corrosion protection, stronger airstair door, more durable interior trim and furnishings all contribute to longer life and savings in maintenance costs.

ASSURED DEPENDABILITY — Electrically-driven gyros and many improvements in the systems and equipment make the Series 300 more reliable, more economical to maintain and operate.

THOROUGHLY PROVEN — Over 290 Twin Otters are in service with 100 operators in 38 countries around the world. Total Twin Otter time exceeds 450,000 flying hours and over 4,000,000 hours have been accumulated on PT6 engines.

GREATER PROFIT POTENTIAL...TWIN OTTER, SERIES 300


UNITED
EXECUTIVE

VERSATILITY... PLUS

TOUGH, EFFICIENT "COMMUTER"

Hustling passengers into and away from the major air terminals is a rigorous life — short hops, heavy loads, many take-offs and landings, long hours every day to maintain busy schedules. This takes TWIN OTTER stamina!

The Series 300 structure is designed with low stress levels for long life. Its fixed tricycle landing gear and "Rubber Block" main shock absorbers require virtually no maintenance. The Twin Otter's reversible propellers with "Beta" control minimize wear and tear on brakes and tires.

Quick turn-around features — airstair door, internal engine start capability, large easy-to-reach baggage compartments, separate crew doors — keep Twin Otter gate time and ramp personnel to a minimum. Twin Otter's STOL characteristics contribute to efficiency too by reducing taxiing, take off and landing maneuver times.

"Q.C."

On wheels, on floats, on wheel/skis, on high-flotation gear . . . Twin Otters are carrying passengers, mail, supplies and equipment to outlying communities and exploration parties around the world. With durable trim and 20 fold-away seats, the Series 300 "Utility" truly is **Q**uickly **C**onverted.

The Twin Otter's large cabin, payload and range capabilities, cargo door, sturdy floor and tie-down fittings make it ideally suited to this versatile role. Reliable PT6A-27 turbine engines and simple, dependable systems permit high utilization of the Series 300 and require little maintenance.

"EXECUTIVE SUITE"

Fly direct and choose your own schedule! With its smooth turbine power and roomy, quiet cabin appointed with luxurious, but functional, furnishings, the Twin Otter becomes your airborne executive suite. Reliable too, because the Series 300 can be equipped for all-weather operations and can carry a wide range of communications and navigation equipment, including weather radar. Since it can take-off and land at small, semi-prepared airstrips, the Series 300 also enables you to visit many smaller communities that cannot be reached by commercial airlines or "Business Jets". Many local, regional and national governments are finding the Twin Otter ideal for developing communications and transportation to less-developed areas.

"SPECIALIST"

Excellent stability characteristics, controllability at low flight speeds, long range and endurance, combined with the space and ability to carry heavy loads, qualify the Series 300 for many other specialized jobs —

— geophysical and photographic surveys
— air ambulance
— forest fire patrol and water bombing
— air drops of personnel, equipment and supplies.

AROUND THE WORLD WE GO . . .

Since 1966, Twin Otter Territory has expanded to include all of the continents. This enviable record earned by Series 100 and 200 Twin Otters speaks for itself . . . rugged, reliable de Havilland Canada airframes powered by dependable Pratt & Whitney turbo-prop engines . . . both backed up by world-wide sales, service, spares and overhaul facilities.

The Series 300 grows from this base; offers more capacity, speed and range, more comfort and safety, longer life and greater dependability as a result of this vast experience.

Afghanistan
Alaska
Antarctica
Argentina
Australia
Bolivia
Canada
Chile
Ecuador
France
Germany
Guadaloupe
Guyana
Hawaii
Indonesia
Italy
Kenya
Libya
Mexico
Nepal
New Caledonia
New Guinea
New Zealand
Norway
Pakistan
Panama
Paraguay
Peru
Saudi Arabia
Singapore
Spain
Sudan
Surinam
Tahiti
Tasmania
Uganda
United States
West Indies

● Twin Otters in service or on order.

▲ Pratt & Whitney dealers or overhaul facilities.

▲ de Havilland Canada agencies or depots.

STOL...

YOUR KEY TO NEW MARKETS

The steady increases in population, the higher concentration of people in expanding urban communities, and the general growth of business activities are creating greater and greater demands for convenient, economical, reliable air transportation. It is also becoming increasingly difficult and expensive to acquire suitable land for additional large air terminals with long runways. Ground and air delays are becoming intolerable and dispersion of air traffic to smaller, more conveniently located airstrips is becoming a necessity. These conditions require airplanes with special capabilities — the ability to operate from **S**hort **T**ake-**O**ff and **L**anding strips (STOL), the ability to maneuver safely at low airspeeds in confined air spaces, the ability to climb and descend steeply for obstacle and terrain clearance.

These characteristics lead to many new markets for air transportation. STOL "Commuter" airplanes are operating in special traffic patterns into short "infield" strips at major air terminals, thereby relieving the main runways for jet traffic. In addition, air service is being extended through STOL airplanes to many communities that cannot afford the long, paved runways required by other commercial airplanes. STOL airplanes are also helping to develop new sources of mineral and oil wealth by flying personnel, equipment and supplies in to survey and exploration parties. The ability to operate from short, semi-prepared airstrips permits Twin Otters to follow the action!


TWIN OTTER

SERIES 300 KEY FACTS

DIMENSIONS

Wing Span	65 ft.	(19.81 m.)
Length	51.8 ft.	(15.77 m.)
Height	18.6 ft.	(5.66 m.)
Main Wheel Track	12.5 ft.	(3.81 m.)
Wheel Base	14.8 ft.	(4.49 m.)
Propeller Ground Clearance	4.5 ft.	(1.37 m.)

WEIGHTS

Maximum Takeoff	12,500 lb.	(5,660 kg.)
Maximum Landing	12,300 lb.	(5,570 kg.)
Basic (20 Seat "Commuter")	6,750 lb.	(3,060 kg.)
Fuel Capacity – Standard	2,457 lb.	(1,112 kg.)
– With Wing Tanks	3,057 lb.	(1,385 kg.)
Wing Loading	29.8 lb./sq. ft.	(14.5 kg./sq.m.)

POWERPLANT

2 Pratt & Whitney PT6A-27 gas turbine engines rated at 620 SHP up to 91°F for takeoff.

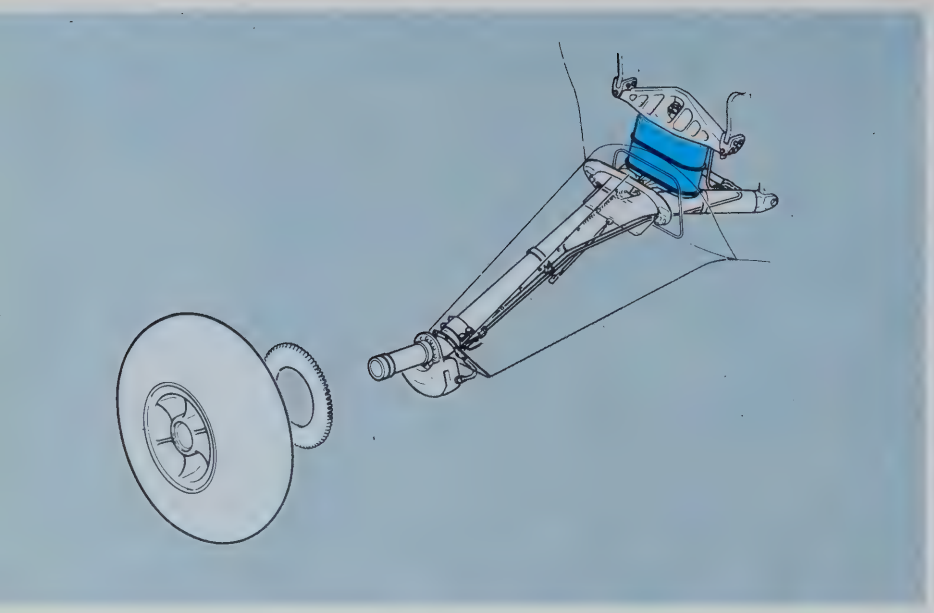
PERFORMANCE AT MAXIMUM WEIGHT

	CAR-3 (U.S. F.A.R. Part 23)	STOL CAPABILITY
Takeoff Distance Sea Level, ISA)		
Ground Run	860 ft. (262 m.)	700 ft. (213 m.)
Distance over 50 ft.	1,500 ft. (457 m.)	1,200 ft. (366 m.)
Landing Distance (Sea Level, ISA)		
Ground Run	950 ft. (290 m.)	515 ft. (157 m.)
Distance over 50 ft.	1,940 ft. (591 m.)	1,050 ft. (320 m.)
Stalling Speed (Power Off)		
Flaps Retracted	74 knots EAS (137 km./hr.)	
Flaps Extended	58 knots EAS (108 km./hr.)	
Rate of Climb (Sea Level, ISA)		
Two Engines	1,600 ft./min. (488 m./min.)	
One Engine	340 ft./min. (103 m./min.)	
Service Ceiling (R/C = 100 ft./min., ISA)		
Two Engines	26,700 ft. (8,140 m.)	
One Engine	11,600 ft. (3,540 m.)	
Maximum Cruise Speed (ISA)		
Sea Level	170 knots TAS (315 km./hr.)	
5,000 ft. (1,524 m.)	181 knots TAS (335 km./hr.)	
10,000 ft. (3,048 m.)	182 knots TAS (337 km./hr.)	

Payload – Range
(20 seat "Commuter" interior, 1 Crew, 100 lb. Radio Allowance, ISA, 45 minute fuel reserve)

	Range	Payload
Standard Tanks	40 NM (75 km.)	4,900 lb. (2,220 kg.)
	680 NM (1,260 km.)	3,000 lb. (1,360 kg.)
With Wing Tanks	880 NM (1,630 km.)	2,200 lb. (1,000 kg.)

SIMPLE OPERATION

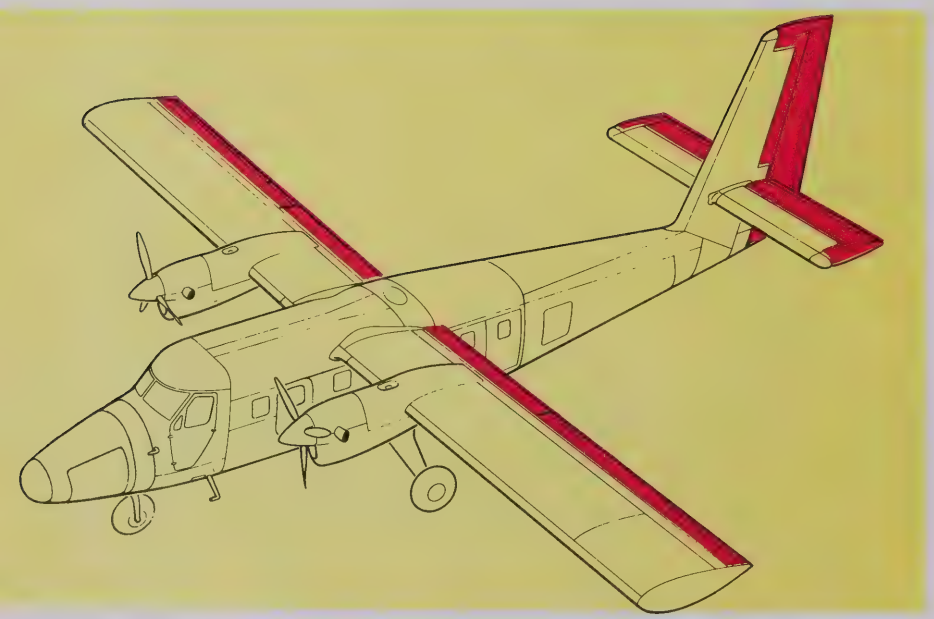


LONG LIFE AIRFRAME

De Havilland Canada's long experience in building simple and rugged STOL airplanes for world-wide use is evident in the Twin Otter. The structure is stiff and stress levels have been kept low to resist fatigue damage and to keep maintenance requirements to an absolute minimum. The most modern and comprehensive surface protection treatments are used throughout the Series 300 to prevent corrosion and extend service life.

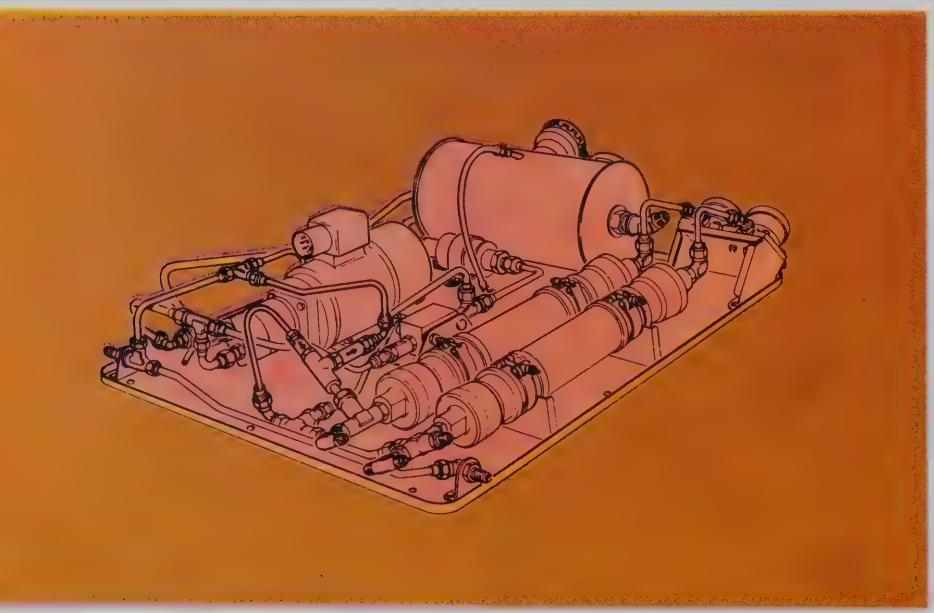
Typical of the design is the fixed tricycle gear: the main gear is rubber sprung and requires virtually no maintenance.

Standard Tire Size	Pressure
Main 11 x 12	38 p.s.i.
Nose 8.90 x 12.50	33 p.s.i.



SINGLE-PILOT OPERATION

Good stability characteristics, powerful controls and low stalling speeds resulting from the full-span, double-slotted flaps give the Twin Otter exceptional maneuverability for takeoff and landing approaches in confined or congested areas. Dual controls are provided, although the Twin Otter has been designed and approved for operation by one pilot. All flying controls are manual with cable and rod actuation systems and trim tabs on rudder, aileron and elevator circuits. Engine, propeller and flap controls are mounted in an overhead console where they can be operated easily by the pilot or co-pilot.



REMOVABLE HYDRAULIC PACK

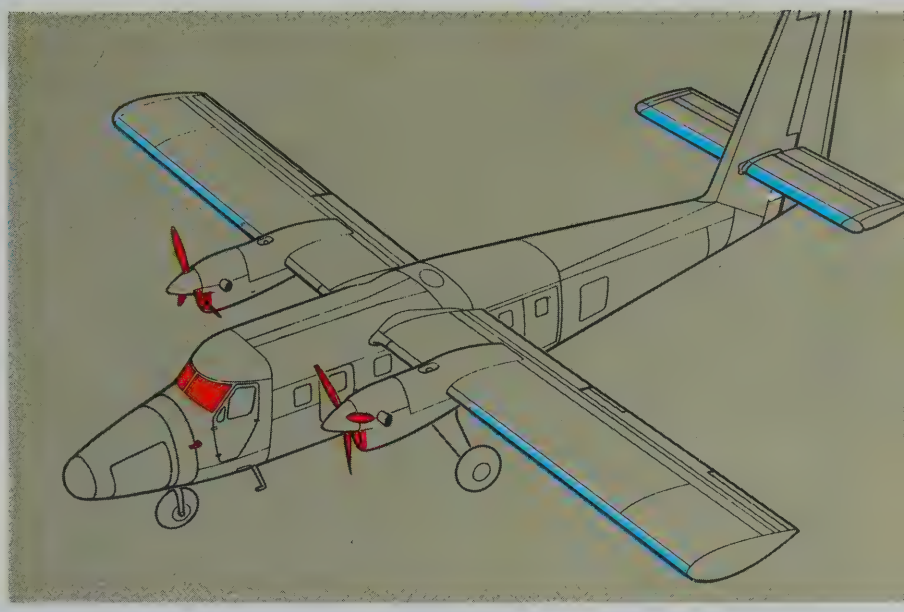
An electrically-operated hydraulic pump provides 1,500 p.s.i. pressure for operating the Twin Otter's flaps, brakes and nosewheel steering. Accumulators smooth system pressure pulses and provide pressure for parking and emergency braking. A hand-operated pump in the crew compartment permits standby or ground operation of the hydraulic system if the electric pump is inoperative. All of the main hydraulic system components are mounted below the cockpit floor on an easily-removed tray to permit servicing or checking away from the aircraft.

ASY MAINTENANCE

ALL WEATHER SYSTEMS

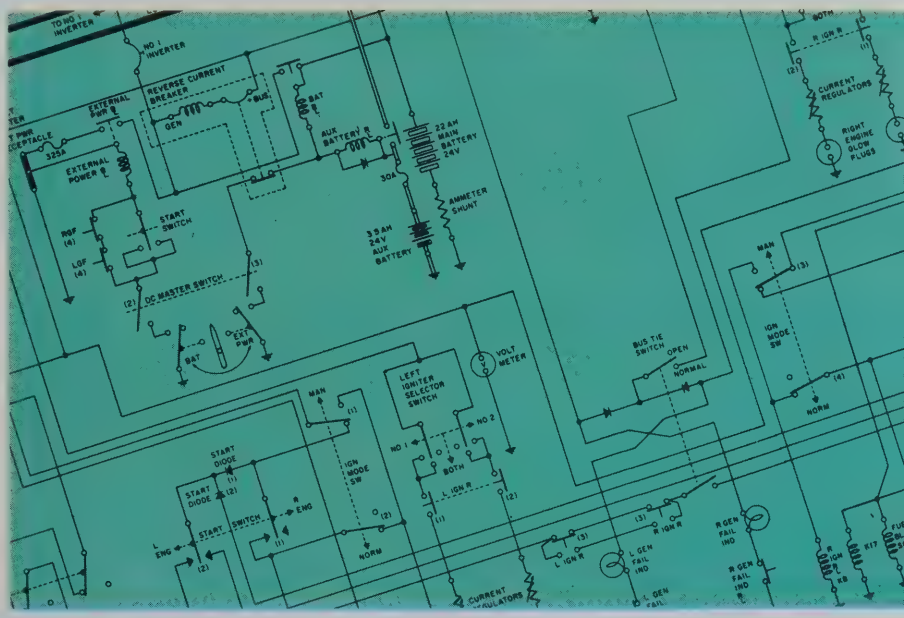
The Twin Otter is equipped with windscreen demisting and defrosting, engine air intake snow separators, and an electrically-heated pitot head for the pilot's air-speed system as standard equipment.

Optional equipment is available to provide additional protection to suit particular requirements. Such options include windshield wipers and washers, second pitot head if co-pilot's instruments are installed, electrically heated windscreen and anti-icing boots for propellers and engine air intake lips, pneumatically-operated de-icing boots for wing and horizontal tailplane leading edges and wing inspection lights.



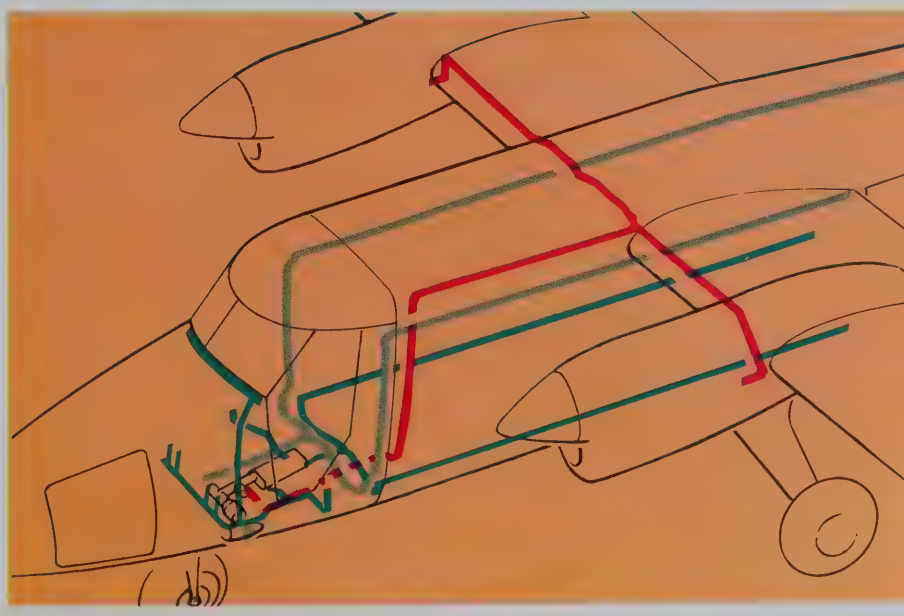
SELF-START CAPABILITY

The primary electrical system on the Twin Otter is 28 volt DC with a 200 ampere starter/generator on each engine. Nickel-cadmium batteries provide emergency power and give self-contained engine starting capability. AC power for instruments and avionics is obtained from static inverters and the entire electrical system can be operated on the ground from an external DC receptacle. Lighting systems have been designed to permit night operation and provide comfort and convenience for both passengers and crew. Complete navigation and communications equipment, including weather radar, can be installed to suit individual customer requirements.



COMFORTABLE ENVIRONMENT

The cabin and crew compartment of the Twin Otter are supplied with ventilating air from a ram intake on the left side of the fuselage nose. Heat is obtained from engine bleed air, which is mixed in an ejector with the ventilating air or recirculated cabin air, as required, to maintain selected temperatures. Distribution of heated air is through outlets in the crew compartment, windshield heating slots and cabin baseboards. Ram air also is distributed to individual passenger-controlled louvers along the cabin above the windows. A fan in the ram air duct provides fresh air during ground operation, and an optional air conditioning system may be fitted for additional passenger and crew comfort.



FROM THE PASSENGERS' VIEWPOINT

The Series 300 Twin Otter means . . .

Convenience . . . with its boarding lights and integral airstair door.

Comfort . . . with airline-style seats set in bright, pleasing cabin decor.

Baggage Capacity . . . over 6 cu. ft. (0.18 cu.m.) or 40 lb. (18 kg.) per passenger.

Individually controlled reading lights and air vents also contribute to passenger favor and the double windows with tinted inner panes reduce noise and glare, thereby helping your passengers enjoy the view afforded by the Twin Otter's high wing layout. Optional air conditioning adds passenger appeal in hot weather.

Series 300 seats, carpets and trim are available in pleasing blue or cinnamon color themes. The standard Series 300 configuration includes 20 passenger seats mounted on adjustable "Douglas" tracks, but optional arrangements are available to accommodate 19 passengers, or 18 passengers and a coat rack. Durable, easily-cleaned materials have been used for the Series 300 cabin interior surfaces to give long life with low maintenance.

For the operator that requires quick conversion for carrying cargo or mail in the cabin, "Custom" furnishings also are available. Fold-away seats in blue or cinnamon color themes can be provided for 13 to 20 passengers. Cargo tie-down fittings are included for maximum utilization.

BROADER OPERATIONAL HORIZONS

The unique performance capabilities of the Twin Otter, combined with its spacious cabin, make the Series 300 ideal for a variety of special roles:

— Executive furnishings — lounge chairs, tables, divans, buffets and bars, toilet installations.

— Photographic survey camera installations (most Zeiss and Wild cameras can be accommodated).

— Litter installations for air ambulance work.

— Geophysical survey equipment installations.

— Aerial dropping of personnel and supplies.

CABIN DATA

Floor length - -	222 in. (5.64 m.)
Floor width - - -	52.5 in. (1.33 m.)
Height - - - - -	59 in. (1.50 m.)
Usable volume - -	384 cu. ft. (10.9 cu.m.)
Floor loading - -	200 lb./sq. ft. (976 kg./sq.m.)
Cargo door—width	56 in. (1.42 m.)
—height	50 in. (1.27 m.)
Floor height from ground - - -	46 in. (1.17 m.)


N594MA

EASY IN...

EASY OUT...

EASY TO GET AT...

Easy access for loading, servicing and maintenance contributes greatly to the TWIN OTTER's efficiency:

- Baggage compartments are easily reached from the ground.

	Usable Volume	Weight Limitation
Nose - - - -	38 cu. ft. (1.1 cu.m.)	300 lb. (136 kg.)
Rear - - - -	88 cu. ft. (2.5 cu.m.)	500 lb. (227 kg.)

- Equipment racks for avionics and crew oxygen are accessible through the nose baggage compartment door.

- Large cargo doors, 56 in. wide x 50 in. high on the left side, permit loading of bulky items.

- Airstair door adds to convenience and passenger appeal.

- Refueling points are readily accessible and accept high flow rates. Fuel capacity is 315 Imperial gallons (378 U.S. gallons, 1,432 liters) in standard tanks, plus 77 Imperial gallons (92 U.S. gallons, 350 liters) in optional wing tanks. Single-point pressure refueling is optional.

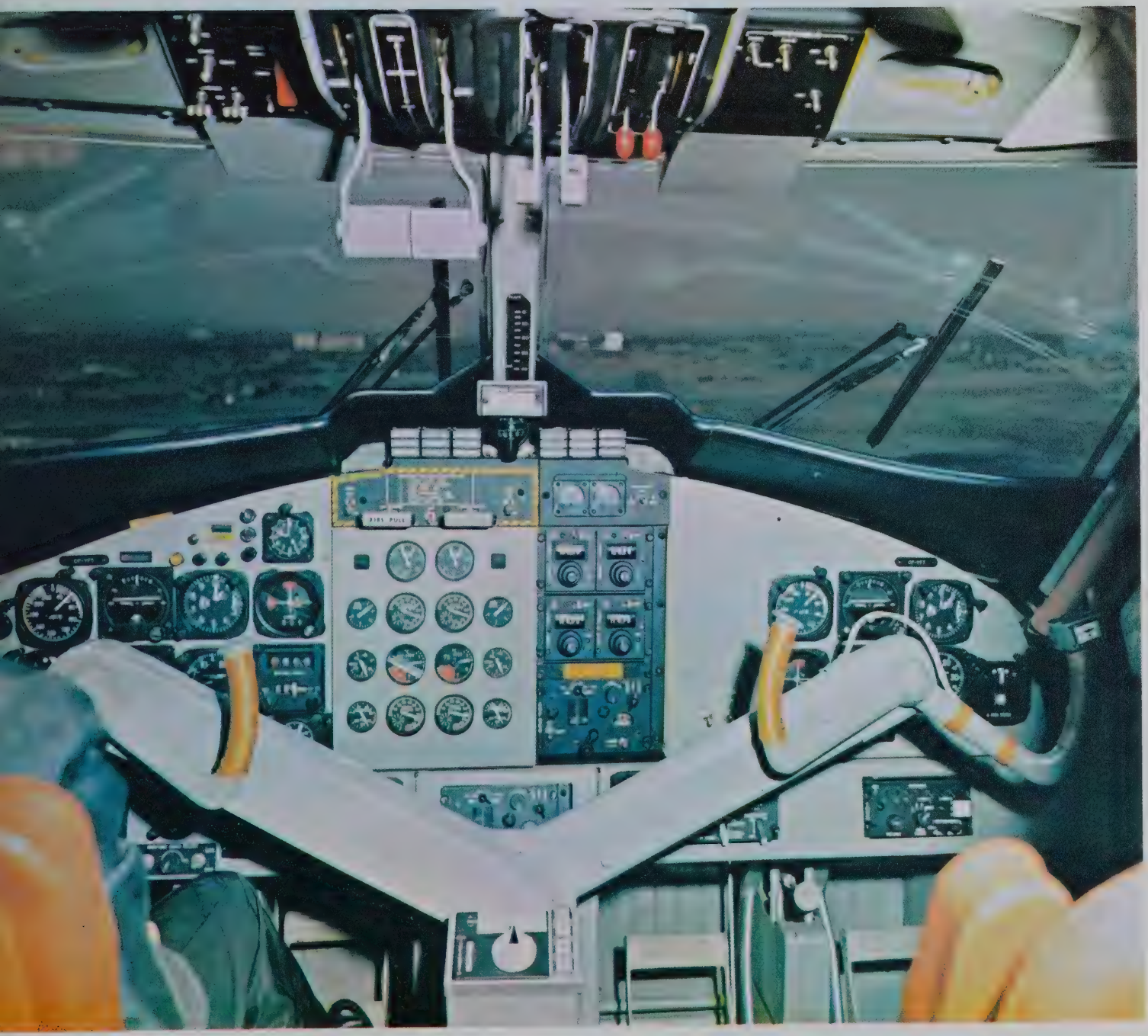
- Hinged lower cowl and removable front upper cowls give excellent access to engines and accessories.

A FRONT OFFICE DESIGNED FOR PROFESSIONALS

The TWIN OTTER's fine reputation as a safe, efficient pilot's airplane is due in large part to the design of the crew compartment. Separate crew doors, adjustable seats for greater comfort, well-harmonized flying controls, good stability characteristics and excellent visibility have all contributed to the TWIN OTTER's popularity.

Although dual controls are fitted as standard equipment, the TWIN OTTER has been designed and approved for single-pilot operation and all essential controls are within easy reach of the pilot. Powerplant controls are located centrally on the overhead console where they can be operated easily by the pilot or co-pilot and engine instruments are located on the center instrument panel Precise maneuvering on snow or water, as well as glide path control is made possible by the TWIN OTTER's propeller Beta-control system which gives rapid, but positive, control of thrust at low power settings.

A wide selection of navigation and communication equipment can be accommodated in the TWIN OTTER, including weather radar and 3-axis auto-pilot with altitude hold, heading pre-select and VOR/ILS coupling options.

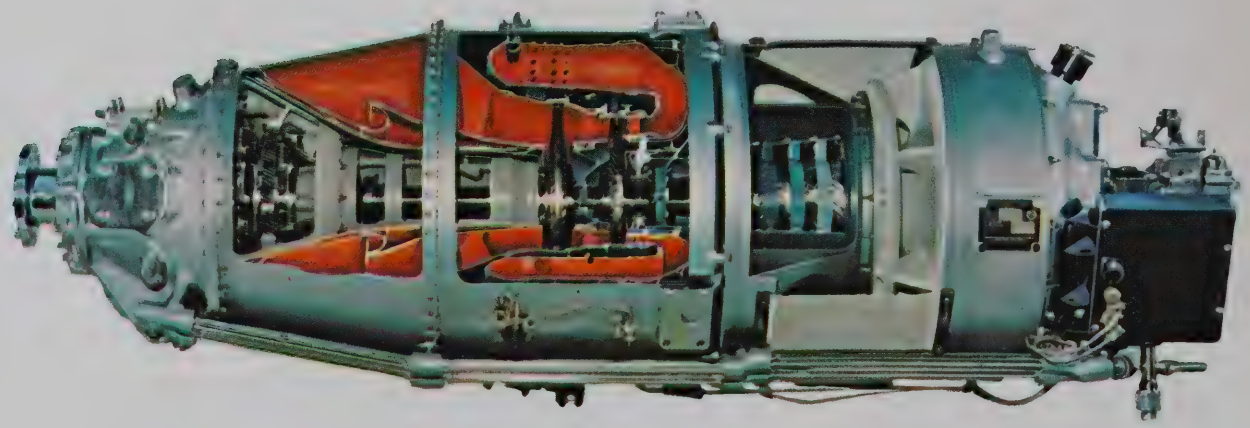


WELL PROVEN
SERIES 300 TURBOPOWER

The Twin Otter, Series 300, is powered by two PT6A-27 turboprop engines driving 8′-6″ diameter reversible Hartzell propellers. The PT6 is a lightweight free-turbine engine which permits operation of the propeller at its maximum cruise efficiency while maintaining high engine efficiency and excellent response. In addition, the free-turbine configuration requires lower starting energy than comparable fixed-shaft turbines and the lower propeller speeds give quieter operation during cruise and taxiing.

Developed from the well-proven -6 and -20 engines used in Series 100 and 200 Twin Otters, the PT6A-27 delivers more power and entered service with an initial overhaul period of 1,500 hours. This has been extended as additional PT6 experience accumulated and now is 2100 hours for Corporate and Utility aircraft. The recommended TBO for engines in Commercial service is 3000 hours.

Improvements incorporated in the PT6A-27 engines include marinization for better protection against corrosion, fuel heaters for cold-weather operation, dual fuel manifolds which give lower turbine inlet temperatures during starting and thereby prolong engine life, and a simplified propeller reversing system.



PT6A-27 POWER RATINGS (Sea Level, Static)

Takeoff	620 SHP to 91°F
Maximum Continuous	620 SHP to 91°F
Maximum Climb	620 SHP to 69°F
Maximum Cruise	620 SHP to 69°F

FUEL — JP-1, JP-4 or JP-5.

PERFORMANCE DATA
TWIN OTTER Series 300 LANDPLANE

TECHNICAL DATA SUMMARY

AVIONICS

TWIN OTTER

Warranty and Product Support. One year or 500 flying hours from date of delivery, whichever comes first! That's the warranty period for the Twin Otter. Your Series 300 also is backed up by the world-wide sales, service, spares and overhaul facilities of de Havilland Canada and United Aircraft — both with enviable records earned over long years of experience. Spare parts, aircrew and technician courses, service and technical field representatives, operating and maintenance manuals, route and economic studies form only part of the support available to Twin Otter operators.

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SERIES 300 TURBOPOWER

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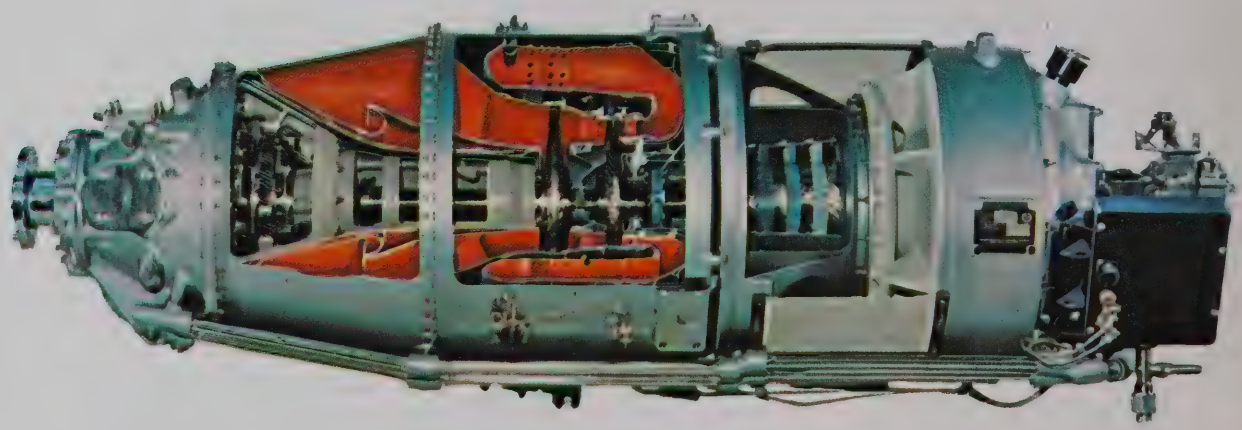

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Maximum Cruise	620 SHP to 69°F

FUEL — JP-1, JP-4 or JP-5.

PERFORMANCE DATA
TWIN OTTER Series 300 LANDPLANE

TECHNICAL DATA SUMMARY

AVIONICS

TWIN OTTER
Series 300

THE DE HAVILLAND AIRCRAFT OF CANADA, LIMITED

DOWNSVIEW ONTARIO CANADA

SEPTEMBER 1970

WELL PROVEN
SERIES 300 TURBOPOWER

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AVIONICS

The avionic systems, equipments and equipment configurations shown are typical for the Twin Otter aircraft. Avionic configurations to suit customers requirements can be provided. Full details are available through the de Havilland Canada Sales Department.

TYPICAL COMM/NAV/ILS/COMPASS SYSTEMS

RCA EQUIPMENT
NO VHF NAV RMI DISPLAY

Dual Audio Controls	AVA-310
Dual VHF COMM	AVC-110
Single VHF NAV/MB/GS	AVN-210
Single VHF NAV	AVN-215
Single Slaved Compass	Sperry C-14
Pilot's RMI	Allen 2105
Co-pilot's RMI	Allen 2109

If a VHF NAV RMI display is required the pilot's RMI becomes an ARC AVI-202

If Autopilot and VHF NAV RMI display is required the co-pilot's RMI becomes an Allen 2105

The AVA-310 contains a 10-watt Audio Amplifier for cabin address use. Six speakers must be added to complete the cabin address system.

PERFORMANCE DATA
TWIN OTTER Series 300 LANDPLANE

TECHNICAL DATA SUMMARY

KING EQUIPMENT
NO VHF NAV RMI DISPLAY

Dual Audio Controls	RCA AVA-310
Dual VHF COMM	KTR-900
Dual VHF NAV	KNR-600A
Single Marker/ Glideslope	KGM-690
Single Slaved Compass	Sperry C-14
Pilot's RMI	Allen 2105
Co-pilot's RMI	Allen 2109

If a VHF NAV RMI display is required KNR-660A's are installed in lieu of the KNR-600A's and the pilot's and co-pilot's RMI's become Allen 2105's

WELL PROVEN
SERIES 300 TURBOPOWER

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COLLINS EQUIPMENT
NO VHF NAV RMI DISPLAY

Dual Audio Controls	RCA AVA-310
Dual VHF COMM	618M-2B
Dual VHF NAV	51R-7A
Single Marker Beacon	51Z-6
Single Glideslope	51V-5
Single Slaved Compass	Sperry C-14
Pilot's RMI	Allen 2105
Co-pilot's RMI	Allen 2109

If VHF NAV RMI display is required 51R-8A's are installed in lieu of the 51R-7A's and the pilot's and co-pilot's RMI's become Allen 2105's

Pictorial NAV display may be added by using the PN-101 compass system in lieu of the Sperry C-14

PERFORMANCE DATA
TWIN OTTER Series 300 LANDPLANE

TECHNICAL DATA SUMMARY

INDIVIDUAL EQUIPMENTS

VHF COMM

King KTR-900
RCA AVC-110
Collins 618M-1 Remanufactured
Collins 618M-1A Remanufactured
King KTR-9000
Collins 618M-2B
Collins 618M-2D

ADF

King KDF-800
King KDF-800
c/w Dual Control
ARC-21A
King KDF-8000
c/w Dual Control
Collins DF-203 (51Y4A)
Collins DF-203 (51Y4)

MARKER BEACON

Collins 51Z-6
Collins 51Z-4
Collins 51Z-4
c/w Self Test
King KGM-690
c/w Glideslope

VHF NAV

RCA AVN-211
King KNR-600A
RCA ANV-215
RCA AVN-212
Collins 51R-7A
King KNR-660A
RCA AVN-210
Collins 51R-8A
Collins 51RV-1 Remanufactured
Collins 51RV-2B

DME

King KDM-700
RCA AVQ-75 Std indicator
RCA AVQ-75 c/w ground
speed and distance indicator
King KDM-7000
Collins 860E-3

WEATHER RADAR

RCA AVQ-46
RCA AVQ-55
RCA AVQ-55 c/w daylight
display

WELL PROVEN
SERIES 300 TURBOPOWER

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GLIDESLOPE

King KGS-680
Collins 51V-5
Collins 51V-4

HF COMM

Sunair SA14RA
Sunair ASB-100 AM & USB
Sunair ASB-100 AM, USB & LSB
Collins 618T-3

AUDIO CONTROL

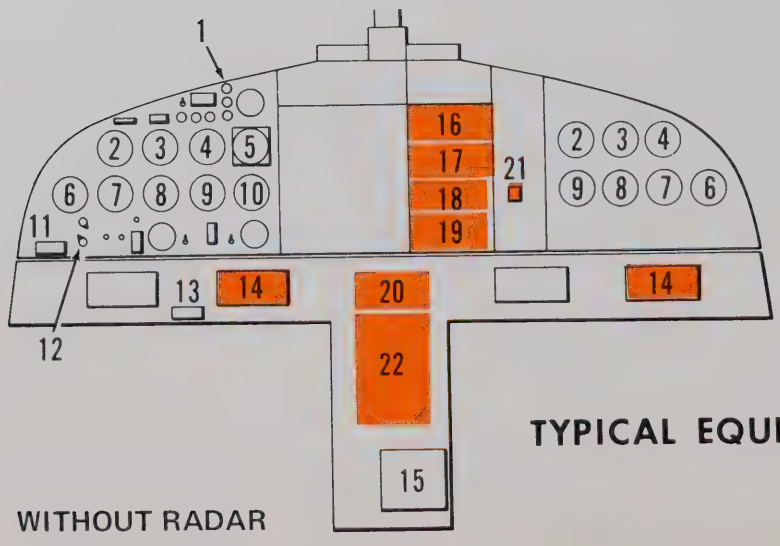
Dual RCA AVA-310

TRANSPONDER

King KXP-750A
RCA AVQ-65
Collins 621A-3
Collins 621A-3
c/w Self Test
Collins 621A-6

CABIN ADDRESS

AVA-310 10-watt System
connected to 6 cabin speakers
Collins 346D-1 60-watt System
connected to 6 cabin speakers
Cabin Attendant MIC



WITHOUT RADAR

TYPICAL EQUIPMENT CONFIGURATIONS

PERFORMANCE DATA
TWIN OTTER Series 300 LANDPLANE

TECHNICAL DATA SUMMARY

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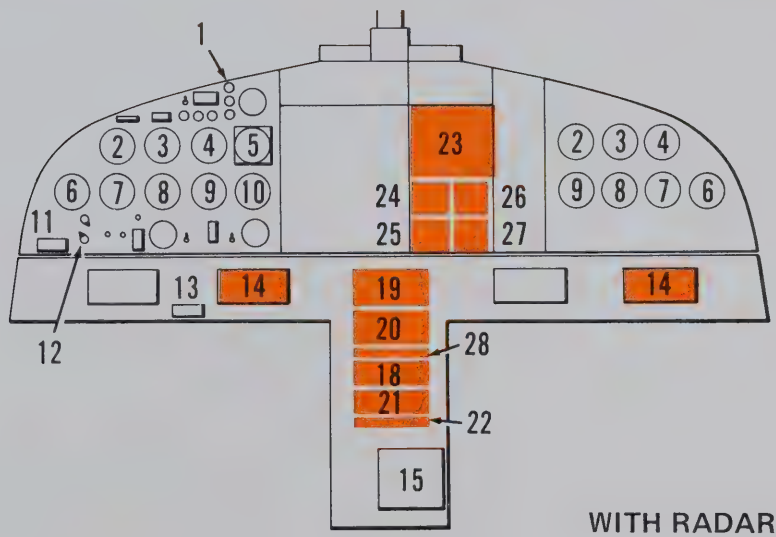
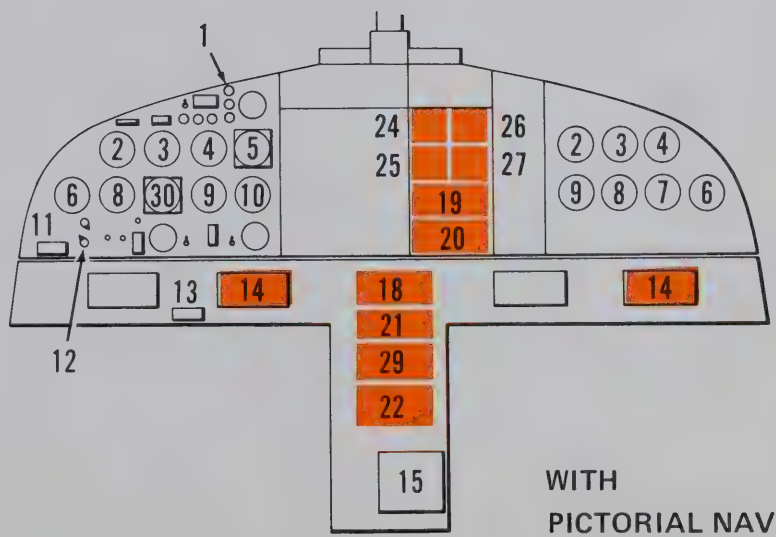


WITH RADAR



WITH PICTORIAL NAV

WELL PROVEN
SERIES 300 TURBOPOWER

The Twin Otter, Series 300, is powered by two PT6A-27 turboprop engines driving 8′-6″ diameter reversible Hartzell propellers. The PT6 is a lightweight free-turbine engine which permits operation of the propeller at its maximum cruise efficiency while maintaining high engine efficiency and excellent response. In addition, the free-turbine configuration requires lower starting energy than comparable fixed-shaft turbines and the lower propeller speeds give quieter operation during cruise and taxiing.

DH
CANADA

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PERFORMANCE DATA
TWIN OTTER Series 300 LANDPLANE

TECHNICAL DATA SUMMARY

TWIN OTTER
Series 300

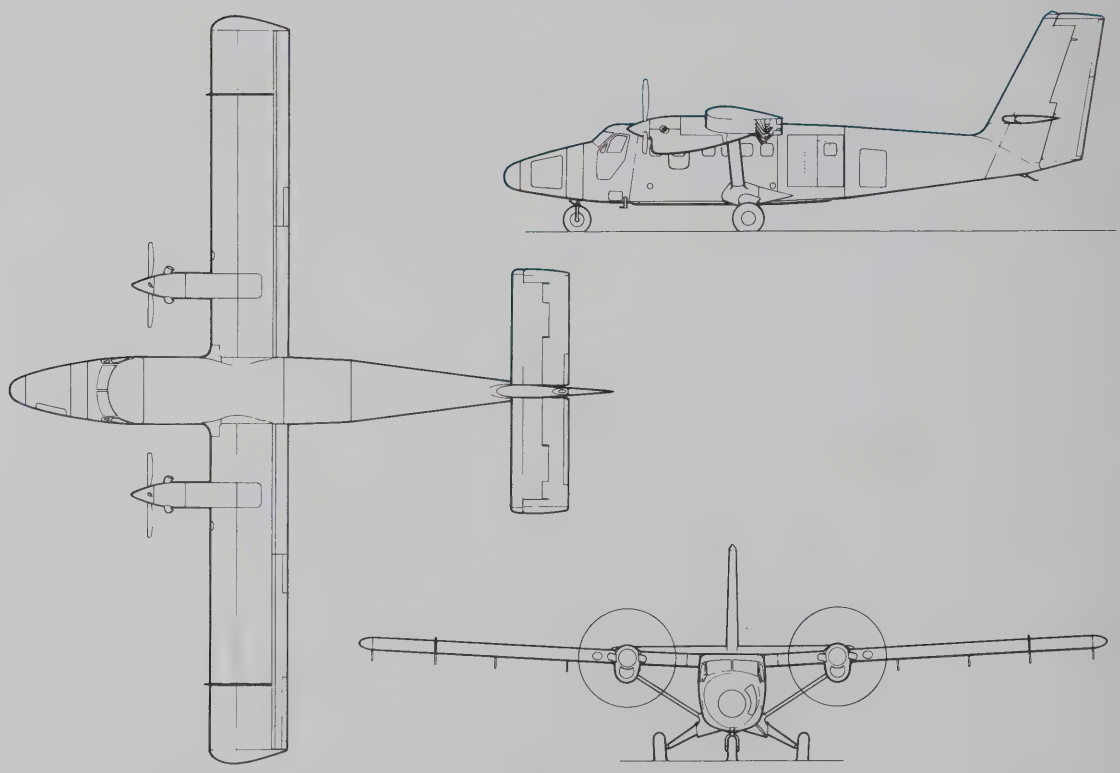
THE DE HAVILLAND AIRCRAFT OF CANADA LIMITED

DOWNSVIEW ONTARIO CANADA

SEPTEMBER 1970

WELL PROVEN
SERIES 300 TURBOPOWER

The Twin Otter Series 300 is a [illegible] PT6A-27 [illegible]



DIMENSIONS

Wingspan	65.00 ft (19.81 m)
Length	51.75 ft (15.77 m)
Height	18.60 ft (5.67 m)

WEIGHTS

Maximum Takeoff	12,500 lb (5660 kg)
Maximum Landing	12,300 lb (5570 kg)
Basic (Commuter)	6,750 lb (3060 kg)
Maximum Fuel Capacity - Standard	2,457 lb (1112 kg)
- With Wing Tanks	3,057 lb (1385 kg)

POWERPLANT

Engines - Pratt and Whitney PT6A-27
Propellers - Hartzell, 3-blade, Reversing
Fuel - JP-1, JP-4 or JP-5
Ratings (Sea Level, Static)

Takeoff and Max. Continuous	620 SHP to 91° F (33° C)
Max. Climb and Max. Cruise	620 SHP to 69° F (20° C)

PERFORMANCE DATA
TWIN OTTER Series 300 LANDPLANE

CERTIFICATION BASIS

The Twin Otter is a Normal Category airplane designed for use in passenger, cargo or special operations such as aerial ambulance and rescue work, forestry patrol and water bombing, photographic and geophysical surveys. It has been certified to FAA Civil Air Regulations, Part 3, dated May 15, 1956, plus amendments 3-1 through 3-8 inclusive (this is equivalent to Federal Air Regulations, Part 23, dated February 1, 1965), plus Special Conditions for the Certification of Multi-Engine Turbine Powered Aircraft, dated November 6, 1964, as detailed in Canadian Department of Transport Type Approval A-82 and United States Type Certificate A9EA. The Series 300 also complies with Special Federal Aviation Regulation No. 23, the latest U.S. airworthiness standard for emergency evacuation, systems design and operation of airplanes in air taxi service. With appropriate equipment, the airplane may be operated under day, night, VFR or IFR conditions.

Optional installations are available for compliance with British ARB and Australian DCA requirements.

The Twin Otter also is approved for flight with the left rear, or both left, cargo doors removed to permit air dropping of personnel, supplies or equipment.

STANDARD AIRCRAFT

AIRFRAME. The Twin Otter, Series 300, features twin turbo-prop power plants, large cabin and baggage compartments, a rugged light-alloy structure and a simple fixed undercarriage. The high wing is rectangular in planform, strut-braced and carries full-span, double-slotted flaps. Each wing is attached to the fuselage by two bolts at the front and rear spar fittings. Light-alloy rivetted construction is used throughout the wing except for the upper skin panels, which have spanwise corrugated stiffeners bonded to them.

The fuselage is constructed in three sections: a nose section containing baggage, avionics and crew compartments; a main cabin section with fuel tanks under the floor; and a rear section containing a second baggage compartment. The primary structure is conventional with frames, stringers and skin of aluminum alloy. The windscreen and cabin windows are acrylic plastic. The cabin floor is of low-density aluminum-faced sandwich construction with seat beams and Douglas track provided.

There are two cabin entrance doors - a double-width cargo/airstair door on the left side and a single door on the right. Escape hatches are provided on each side of the fuselage near the front of the cabin . The crew compartment has separate external doors and a central doorway through the bulkhead to the cabin. Nose and rear baggage compartments are accessible from doors on the left side of the airplane.

WELL PROVEN
SERIES 300 TURBOPOWER

The empennage comprises a horizontal tailplane, elevator, fin and rudder, all of conventional aluminum alloy construction. The horizontal tailplane and fin are bolted to the rear fuselage structure.

The fixed tricycle undercarriage has a steerable nosewheel and independent, hydraulically operated disc brakes on the main wheels. The main landing gear features steel leg beams and urethane compression-block shock absorbers attached to the fuselage frames. An oleo-pneumatic shock absorber and an in-flight centering device are fitted to the nose gear. Nosewheel steering is hydraulic and is controlled by a handle mounted on the pilot's control wheel shaft. Tubeless tires are fitted on all wheels:

	Tire Sizes	Tire Pressures
Main Wheels	11 x 12	38 psi
Nose Wheel	8.90 x 12.50	33 psi

The corrosion-protection treatments used in the Twin Otter include many of the newer techniques and materials in order to provide maximum resistance to corrosion. Interior parts made from aluminum alloy sheet are alodined and primed with zinc chromate. Chromic acid anodizing is used in place of alodining for parts fabricated from extrusions, bar and bare plate stock. In the fuel tank area below the floor, on machined primary structure details, and in the engine nacelles, an additional epoxy primer is added. For the structurally bonded wing and tailplane skin panels, the surfaces are anodized and primed with phenolic-nitrile base primer prior to bonding. This primer forms part of the bonding process and also provides corrosion protection to the unbonded surfaces of the assemblies. External machined details, such as flap and aileron hinge arms, are anodized, primed with epoxy primer and painted. The external surfaces of the landing gear struts are sprayed with aluminum, primed with epoxy primer and painted with a urethane system chosen for good adhesion and resistance to fuel, oil and impact damage.

POWER PLANT. The Twin Otter, Series 300 is powered by two Pratt and Whitney PT6A-27 turboprop engines as defined in P & W Commercial Sepc. No. 583, dated January 10, 1967.

The PT6A-27 is a light weight, free-turbine engine with a screened annular air inlet, three axial and one centrifugal stages of compression, annular reverse-flow combustion chamber and single stage compressor and power turbines. Two-stage planetary gearing provides output shaft speeds compatible with propeller requirements. Developed from the widely-acclaimed -6 and -20 versions, the PT6A-27 offers increased power, cooler starting due to dual fuel manifolds and a simpler propeller reversing system. Twin Otter engines are marinized for internal corrosion protection and are equipped with fuel heaters, automatic oil temperature control systems and wash systems.

Each engine drives a Hartzell HC-B3TN-3D three-bladed, 8' - 6" diameter, full-feathering, reversible propeller. In the normal flight range, propeller speed may be selected by the pilot and is maintained by

the action of the propeller speed governor. In the low-power region, propeller blade angle is controlled directly by the pilot's power lever and may be varied progressively from forward thrust through zero to reverse for taxiing or braking. This is particularly useful for maneuvering on water or slippery surfaces. Propeller blade angle and power are programmed jointly in this "Beta Control" region for good thrust response. Overspeed protection is provided by the fuel topping governor on the engine.

Engine starting is electric, using power drawn from either the airplane battery or a 28 volt dc external supply. A separate battery is fitted for operating engine starting relays and igniters. Each engine has a 200 ampere starter/generator mounted on the accessories gearbox which is coupled to the gas generator.

The engines are installed in wing-mounted nacelles which also house the accessories, oil coolers and fire extinguishing systems. Intake air deflectors are installed in the lower cowl of each nacelle to prevent the entry of snow and ice into the engine plenum chamber. Access to all power plant components is gained by lowering the hinged bottom cowl and removing the front upper cowl. Checking and replenishing the oil supply is facilitated by separate access doors. Each nacelle is equipped with fire detection switches located in the accessories and air intake plenum chambers. A supply of trifluorobromomethane fire extinguishing agent is carried behind each firewall. Fire warning indicators and extinguishant controls are located centrally on the flight crew instrument panel.

SYSTEMS

(a) **CONTROLS.** All flying controls are manually operated through cable and rod systems. Dual controls are provided, although the Twin Otter is certified for operation with a minimum crew consisting of one pilot. Excellent stability, powerful controls, and low stalling speeds which result from the full-span, double-slotted flaps give the Twin Otter exceptional maneuverability for takeoffs and landings in confined or congested areas.

Trim is provided about all three axes by manually-operated tabs on the rudder and elevator and an electrically-driven tab in the left aileron. Geared tabs are fitted to the rudder and ailerons to lighten control forces and a tab fitted to the right elevator is linked to the flaps to control longitudinal trim during flap retraction and extension. Gust locks attach to the control systems at the pilot's position and are stowed in the crew compartment.

(b) **HYDRAULICS.** An electrically-driven hydraulic pump provides pressure at 1500 psi for operating the landing flaps, brakes, nosewheel steering and the ski retraction mechanism if wheel/skis are fitted. A hand pump in the crew compartment provides emergency pressure and permits ground operation if the electric pump is inoperative. Accumulators smooth system pressure pulses and provide pressure for parking and emergency braking. Main and brake system pressure gauges are installed in the crew compartment.

WELL PROVEN SERIES 300 TURBOPOWER

The Twin Otter, Series 300, is powered by two PT6A-27 turboprop engines

All of the main components of the hydraulic system including the electric pump, filter, accumulators, reservoir, charging valves and gauges, are mounted on a readily removable tray under the floor of the crew compartment. This permits servicing and checking of the package away from the airplane. Hydraulic fluid complying with Specification MIL-H-5606 is used in the Twin Otter system.

(c) **FUEL SYSTEM.** JP-4, JP-5, Aviation Kerosene, Arctic Diesel fuel, or in an emergency, aviation gasolene is carried in two tanks, each comprising four interconnected, flexible cells located under the cabin floor. The forward tank 152 Imp. Gal. (182 U.S. Gal.) normally feeds the right engine and the rear tank 166 Imp. Gal. (199 U.S. Gal.) the left engine, but both engines can be fed from either tank if necessary. Fillers for each tank are located on the left side of the fuselage and water drains are accessible underneath the aircraft. Each tank is equipped with main and standby centrifugal boost pumps with integral strainers and radio noise filters. These pumps are rated at 450 lb/hr fuel at 22 psig at sea level when supplied with power at 28 volts dc. Pressure switches warn the pilot of low fuel pressure and automatically cut in the standby pumps. The tank venting system maintains a slight positive pressure in the tanks in flight and prevents the escape of fuel in all normal flight attitudes.

Fuel quantity is sensed by 8 capacitance units, one in each cell, and is indicated on two gauges mounted below the pilot's flight panel. Low-level warning is sensed by float switches in the boost pump cells and thereby warns the pilot of low fuel quantity (60 lb in forward tank, 130 lb in rear tank) or faulty fuel transfer between cells. Transfer is effected by gravity through manifolds connecting the cells of each tank and ejector pumps which prevent fuel starvation during sustained periods at high airplane pitch altitudes. Electrically-operated shut-off valves are located near the firewall of each engine nacelle and a flow meter transmitter, 10 micron filter, and fuel heater is fitted in the fuel line to each engine.

(d) **LUBRICATION.** The engine oil tanks are integral with the engines. Each has a usable capacity of 2 Imp. gallons plus air space and incorporates venting, filler, dipstick and an air/oil separator. Scavenge oil is returned from the engine through oil/fuel and oil/air coolers, each with thermostatically controlled by-passes. Synthetic type lubricating oils conforming to specifications CPWA 202 (7.5 Centistokes) or PWA 521 (5 Centistokes, Type II) may be used, provided that the two types are not mixed.

(e) **VENTILATION AND HEATING.** The cabin and crew compartment of the Twin Otter are supplied with ventilating air from a ram air intake on the left side of the fuselage nose. Heat is obtained from hot air bled from the engine compressors and mixed in an ejector with the ventilating air or re-circulated cabin air as required to maintain selected temperatures. This air is distributed through four outlets in the crew compartment, windscreen heating slots, and baseboard heater outlets in the cabin. Ram air also is distributed to individual passenger-controlled louvers conveniently located along the cabin above the windows. An electrically-driven fan in the ram air duct provides fresh air during ground operations when ram air is not available. Temperature controls are mounted on an overhead panel in the crew compartment.

(f) **ELECTRICAL SYSTEM.** The primary electrical system on the Twin Otter is 28 volt dc with a 200 ampere starter/generator on each engine. A 39 ampere-hour nickel-cadmium battery provides emergency power and gives self-contained engine start capability. A separate 3.6 ampere-hour battery supplies independent power for engine starting relays and igniters. 400 cps AC power for instruments and avionics is obtained from 250 VA main and standby static inverters. An external DC receptacle located aft of the left hand cabin door permits operation of the complete system on the ground.

Controls for engine starting and generator switching are mounted on the pilot's overhead panel, DC circuit breakers are grouped on a panel on the left side of the cockpit and AC buses are located on the bulkhead behind the pilot. A DC voltmeter and load meter are positioned to the right of the emergency panel, along with a switch to select left generator, right generator or battery. Warning lights for AC and generators are in the caution lights panel.

Lighting systems have been designed to permit night operation with comfort and convenience for both passengers and crew. The cabin is illuminated by two-level ceiling lights, passenger reading lights and a passenger entrance light. Nose and rear baggage compartments also are equipped with lights and convenient switches. Lighting in the crew compartment includes post-lit flight instrument panels, edge-lit engine and fuel instrument panels, eyebrow lights for the brake and hydraulic system pressure gauges, an internally lit magnetic compass, two utility lights and a dome light. External lighting comprises position lights at the wing tips and tail, two landing lights located in the wings outboard of the nacelles and a single red anti-collision light on the top of the fin. Structural provisions are provided for the installation of a wide variety of communications and navigation equipment, including antennas.

(g) **INSTRUMENTS.** The standard Twin Otter, Series 300, is equipped with the following instruments:

Pilot's Flight Panel	- Airspeed Indicator Attitude Indicator (Electrically Driven) Altimeter Turn and Slip Indicator (Electrically Driven) Directional Indicator (Electrically Driven) Vertical Speed Indicator Clock Stall Warning Light
Fuel Control Panel	- Fuel Quantity Gauge (2)
Engine Instrument Panel	- Torque Indicator (2) Propeller RPM Indicator (2) Inter Turbine Temperature Indicator (2) Gas Generator RPM Indicator (2) Oil Pressure Indicator (2)

WELL PROVEN SERIES 300 TURBOPOWER

The Twin Otter, Series 300, is powered by two PT6A-27 turboprop engines driving 8' 6" diameter reversible Hartzell propellers. The PT6 is a light weight

	Oil Temperature Indicator (2)
	Fuel Flow Indicator (2)
Miscellaneous	- Hydraulic System Pressure Gauge
	Brake System Pressure Gauge
	Flap Position Indicator
	Aileron Trim Position Indicator
	Magnetic Compass
	Outside Air Temperature Indicator
	DC Voltmeter
	DC Load Meter
	Caution Lights
	Emergency Panel
	Stall Warning Horn

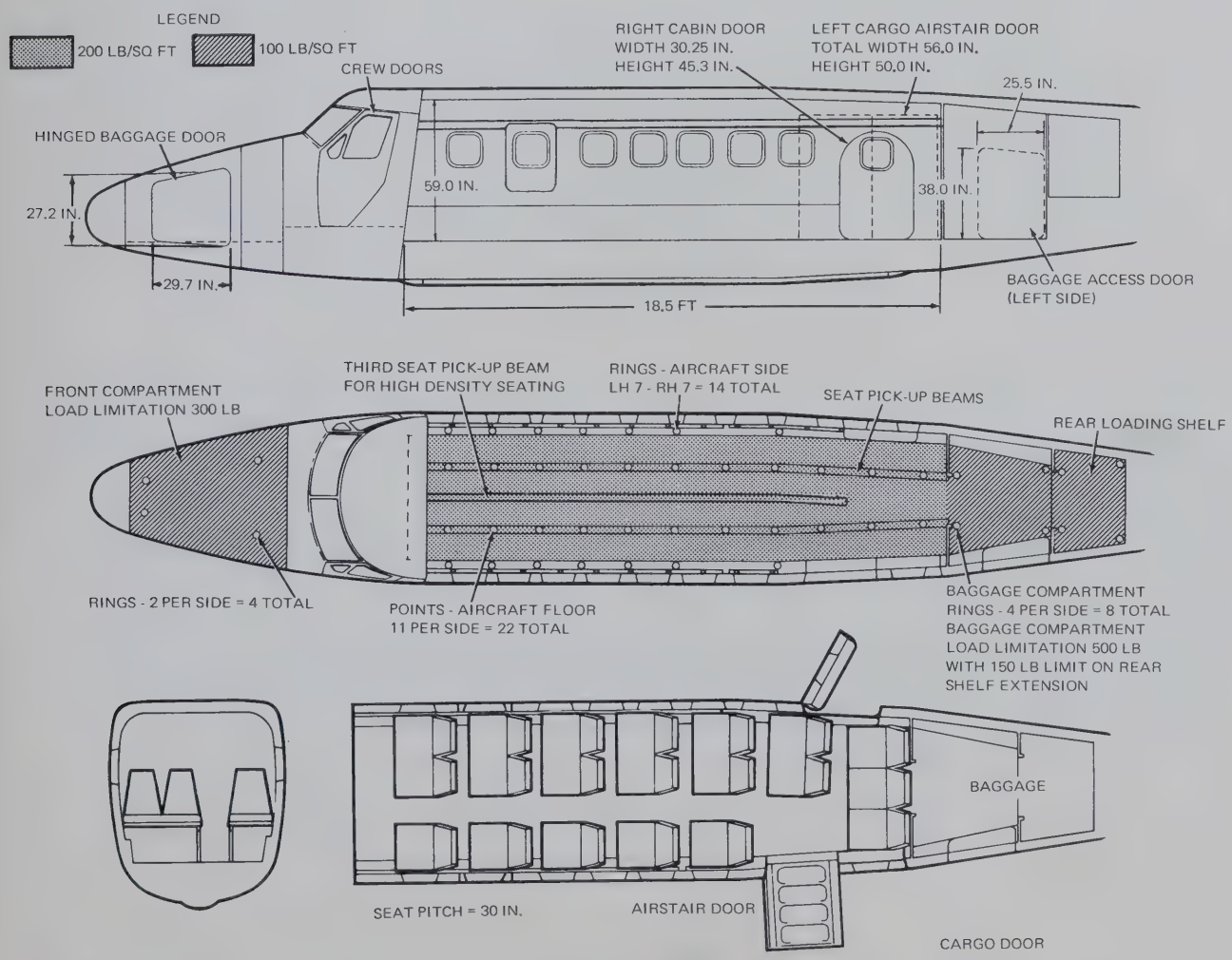
FURNISHINGS

The roomy cabin of the Twin Otter is well suited to a variety of applications: utility passenger/cargo operations, high density "Commuter" work, "Executive" interiors, photographic survey camera installations, litters for air ambulance duties and many other specialized jobs. The standard Series 300 aircraft is fully equipped for "Commuter" service, including 20 comfortable passenger seats trimmed in cloth and vinyl to airline standards, lap belts, cabin trim, carpets, airstair door with extension step, double windows with tinted inner panes, ash trays, reading lights and air vents at each seat location, "NO SMOKING/FASTEN SEAT BELT" sign on front bulkhead. The seats are mounted on Douglas tracks for quick removal or variation of seat pitch. A choice of blue or cinnamon color themes is available for interior furnishings.

Fully-adjustable bucket-type seats are provided for the pilot and co-pilot, complete with seat and back cushions, arm rests and safety belts. The crew compartment upholstery is a washable, vinyl-coated quilted fabric for thermal and acoustic insulation. A hand-operated fire extinguisher is located in the crew compartment and an ash tray is mounted on the control column.

PERFORMANCE DATA
TWIN OTTER Series 300 LANDPLANE

Baggage may be carried in two compartments - one in the nose and one aft of the cabin. The rear compartment is accessible from an external door on the left side of the airplane. Usable volume of this compartment is 88 cu ft with a 500 lb weight limitation (150 lb on rear shelf). Eight tie-down rings and two lights are installed in the rear baggage compartment. The front baggage compartment has a usable volume of 38 cu ft and a weight limitation of 300 lb. This compartment is accessible from a door on the left side of the airplane and is equipped with four tie-down rings and a light. Main access to the airplane is through doors located at the rear of the cabin - a single door 30.25 in. wide x 45.5 in. high on the right side and a quickly removable cargo/airstair door with a total width of 56 in. and a height of 50 in. on the left side. Entry to the crew compartment is by separate external doors or the doorway through the cabin/crew compartment bulkhead. A step is provided below the door on the pilot's side of the airplane. Emergency exits are incorporated in the Series 300 and are located near the front of the cabin on each side.



WELL PROVEN SERIES 300 TURBOPOWER

The Twin Otter, Series 300, is powered by two PT6A-27 turboprop engines driving 8′-6″ diameter reversible Hartzell propellers. The PT6 is a lightweight

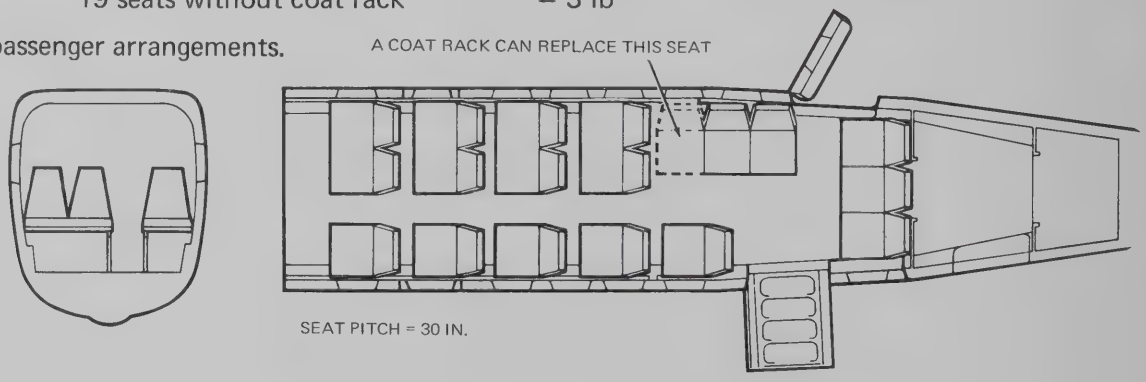
CUSTOMER OPTIONS

This section defines optional features and equipment designed to improve the usefulness and efficiency of the Twin Otter for Customers' specific requirements. These items can be supplied and installed in the Series 300 during manufacture by Customer request.

ALTERNATE "COMMUTER" SEATING ARRANGEMENTS. In place of two forward-facing double seats, 3 side-facing seats or 2 side-facing seats and a coat rack can be installed in the Series 300 cabin. The weight difference from the standard airplane weight is:

18 seats with coat rack	– 10 lb
19 seats without coat rack	– 3 lb

18 and 19 passenger arrangements.



FOLDING COMMUTER SEATS. These seats mount on Douglas Track and can be folded and stowed against the sidewalls for quick conversion to a mail/cargo configuration. The weight increment is 3 lb per single or double seat.

AIRSTAIR DOOR RESTRAINT. This damper controls the rate at which the airstair door is lowered and provides a spring assist during closing. The weight increment is 7 lb.

AIR CONDITIONING. An electrically-driven Freon-type air conditioning system can be installed. The mechanical components are located under the floor at the rear of the cabin and the cool air is ducted up through the rear baggage compartment and distributed along the ceiling of the cabin and crew compartment. The weight increment is 131 lb.

TOILET INSTALLATION. A chemical toilet can be installed in the rear baggage compartment. The installed weight is 37 lb.

PERFORMANCE DATA
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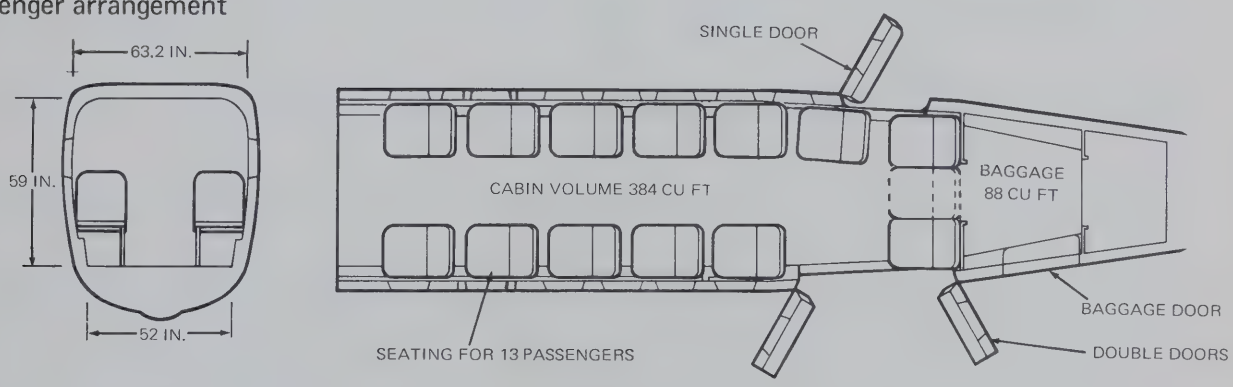
"UTILITY" INTERIOR. In place of the "Commuter" interior, "Utility" furnishings are available comprising light fold-away seats for 13 to 20 passengers. The lower cabin trim has a durable, scuff-resistant finish and carpets and Douglas track are deleted. The cabin floor is designed to carry uniformly distributed loads up to 200 lb/sq ft. Seat beams are located to accommodate single seats on each side of the cabin or high-density seating arrangements. Cargo tie-down rings can be installed at various points throughout the cabin and 10 tie-down rings are provided. The weight changes are:

20 seat arrangement	- 203 lb
13 seat arrangement	- 257 lb
Removable center rear seat	- 10 lb

13 passenger arrangement



DOUBLE WIDTH CARGO DOOR. In place of the airstair door, a forward-opening door and access ladder can be provided. The door opening is 56 in. wide x 50 in. high and the weight change is - 36 lb.

OXYGEN SYSTEMS. Oxygen systems are available for Twin Otter crew and passengers. The crew system consists of a 650 cu in. bottle charged to 1800 psi located in the equipment racks in the nose compartment, a charging valve and gauge, two MD-2 diluter/demand regulators and two Sierra 520-30 oxygen masks with microphones. Interconnection to the passenger system, if fitted, is by means of an emergency selector valve. The passenger oxygen system uses two 1590 cu in. bottles located in the rear baggage compartment along with pressure gauge, charging valve and shut-off valve. A continuous flow pressure regulator distributes oxygen to 20 outlets located adjacent to the passenger seats. Disposable masks with adaptors are stowed at the front of the cabin.

Weight increments are:

Crew system	34 lb
Passenger system, 20 outlets	117 lb

WELL PROVEN SERIES 300 TURBOPOWER

The Twin Otter, Series 300, is powered by two PT6A-27 turboprop engines driving 8′-6″ diameter reversible Hartzell propellers. The PT6 is a lightweight

PILOT'S AND CO-PILOT'S SHOULDER HARNESS. Crew shoulder harness and inertia reel installations are available. Weight increment 8 lb.

CO-PILOT'S INSTRUMENTS. A co-pilot's instrument panel with red or white post lighting is available. Basic instruments include airspeed indicator, altimeter, attitude indicator, turn and slip indicator, vertical speed indicator and direction indicator. A second pitot head is installed on the right side of the nose to provide pressure for the co-pilot's airspeed indicator. Static pressure is obtained from the upper static vents on each side of the airplane nose. Weight increment is 16 lb.

INSTRUMENT LIGHTING. Red or white instrument panel post lighting may be selected.

CO-PILOT'S FLIGHT COMPARTMENT DOOR STEP. Co-pilot's step from co-pilot's door sill similar to pilot's installation is available. Weight increment 4 lb.

CREW COMPARTMENT FANS. Two swivel fans are available for installation in the crew compartment for windshield demisting and compartment cooling. Weight increment 4 lb.

PROPELLER SYNCHRONIZATION KIT. A Woodward propeller synchronization system is available for Series 300 airplanes. Weight increment 8 lb.

HYDRAULIC PRESSURE WARNING LIGHT. A warning light can be installed to indicate when the hydraulic pump circuit breaker is open.

LEAD-ACID BATTERY. In place of the nickel-cadmium battery, a 36 ampere-hour lead-acid battery may be selected. The weight increment is 3 lb.

TAXI LIGHT. A taxi light can be installed on the nose wheel oleo leg. Weight increment 2 lb.

ADDITIONAL ANTI-COLLISION BEACON. An anti-collision beacon may be installed on the underside of the airplane in addition to the standard beacon mounted on top of the vertical tailplane. Weight increment 3 lb.

EXTERNAL PAINT. Either epoxy or urethane base paint can be applied in accordance with colour schemes specified by the customer. A typical paint finish with flight stripes weighs 30 lb.

PERFORMANCE DATA
TWIN OTTER Series 300 LANDPLANE

PNEUMATIC SYSTEM. A low-pressure (18 psig) pneumatic system is required for operation of the auto-pilot or wing and tailplane de-icing boot options. The system uses bleed air tapped from the engine compressor/cabin heater line and incorporates an air-to-air heat exchanger, strainer, pressure regulating valve, pressure gauge, pressure switch to operate a low-pressure warning light, and piping necessary for connection to the selected optional equipment.

AUTO-PILOT. The King (Honeywell) H-14 pneumatic auto-pilot has been certified for use with the Twin Otter. It is a three-axis system comprising computer, flight controller and servos for aileron, rudder and elevator circuits. The controller/mode selector is mounted on the control column and a disengage switch is located on the pilot's control wheel.

Optional features include

(a) Altitude control
(b) Heading selector
(c) VOR/ILS coupler
(d) VOR/ILS selector
(e) Pitch auto trim

The optional pneumatic system package is required with the auto-pilot. Total weight increment is 60 lb.

DE-ICING AND ANTI-ICING SYSTEMS. Optional all-weather equipment for the Twin Otter includes pneumatically-operated de-icing boots for outer wing and horizontal tailplane leading edges, electrically-heated anti-icing boots for the propellers and engine intake lips windscreen wipers and washers (1 U.S. Gal. reservoir), laminated glass windscreen with electric heating, and wing inspection lights. The pneumatic system option is required when wing and tailplane de-icing boots are fitted.

Weight increments are:

Wing and horizontal tail de-icing boots	99 lb
Wing inspection lights	1 lb
Electrically-heated propellers	18.4 lb
Electrically-heated air intake lips	5 lb
Electrically-heated windscreens	34 lb
Windshield wipers and washers with fluid	26 lb
Ice guards on fuselage sides	2 lb

RANGE EXTENSION FUEL SYSTEM. Approximately 75 Imp. gallon of additional fuel may be carried in optional wing tanks located near the wing tips ahead of the front spars. These tanks may be filled "over wing" or by transfer from the fuselage tanks. The weight increment is 120 lb.

PRESSURE REFUELING. A single-point pressure refueling system can be added. The adapter and controls are located in the rear fuselage on the right-hand side of the aircraft. The weight increment is 46 lb.

WELL PROVEN
SERIES 300 TURBOPOWER

The Twin Otter, Series 300, is powered by two PT6A-27 turboprop engines driving 8′-6″ diameter reversible Hartzell propellers. The PT6 is a lightweight

FLOAT INSTALLATION. The float installation is applicable only to Twin Otter airplanes without Mod 6/1077, Extended Nose Compartment. In addition, finlets must be added to the upper and lower surfaces of the horizontal tailplane. The maximum take-off and landing weight on floats is 12,500 lb. The weight increments for the float installation and associated options are:

Float installation	834 lb
Allowance for Mod 6/1077, Extended Nose	- 53 lb

ASSOCIATED OPTIONS WITH FLOATS

(a)	Cockpit door ladders, fixed (left and right)	13 lb
(b)	Cabin access ladder, fixed (left)	5 lb
(c)	Alternative stowage for cabin access ladder for access from starboard float when airstair door installed	1 lb
(d)	Wing/engine access ladder with stowage on float	14 lb
(e)	Rear baggage loading platform with stowage on float	7 lb

WHEEL/SKIS. Hydraulically raised and lowered skis can be fitted to the standard landing gear with minor changes. A selector valve and position indicator lights are located below the fuel system control panel. The weight increment for wheel/skis is 670 lb.

SPRING SKIS. The spring ski installation weighs 396 lb more than the standard wheel gear.

HIGH FLOTATION GEAR. Optional wheels and tires are available to permit operations in soft field conditions:

	Main Wheels	Nose Wheel	Weight Increment
Size	15.0 x 12.0	15.0 x 12.0	77 lb
Tire Pressure	27 psi	12 psi	

A special fork for the nosewheel is used for these installations.

CAMERA INSTALLATIONS. Installations for most Wild or Zeiss aerial survey cameras can be made in the rear cabin area. Typical weight increments are:

Provisions, less camera and window	18 lb
Provisions and window for Wild RC-8	58 lb
Provisions and window for Wild RC-9	57 lb

PERFORMANCE DATA
TWIN OTTER Series 300 LANDPLANE

BRITISH ARB CERTIFICATION PACKAGE. Airplanes to be operated in accordance with British ARB regulations require the following items:

shoulder harness for crew, 3/8" thick windscreen, wing-tip and fin lightning protection, generator overheat detector, airspeed indicator and artificial horizon to British requirements, fire warning bell, stall warning horn, cabin emergency lights, fuel crossfeed valve indicator, symmetric de-icing boot inflation, fuel system check valve direction marking, three-position interphone switch, ARB flight manual. The weight increment is 26 lb.

AUSTRALIAN DCA CERTIFICATION PACKAGE. Aircraft to be operated in accordance with Australian DCA regulations require the following items:

shoulder harness for crew, additional water drain valves in the fuel system, instrument markings and placards to DCA requirements, audible fire warning, relocation of inverter control switches, "disengage" warning and static system shut-off valve if autopilot and altitude hold options are installed.

AVIONICS

Typical installations of communications and navigation equipment are illustrated in a seperate Twin Otter Avionics folder. De Havilland can supply these, or design special installations to suit Customers' requirements.

SPECIAL INSTALLATIONS

By special order, de Havilland Canada will design (if required), supply and install furnishings or equipment to Customer specifications. Such items include "Executive" interiors, toilet installations, long range (ferry) fuel systems, weather radar, special equipment racks, antennas, etc. These items normally are fitted to the Customers' airplanes after completion of manufacture.

WELL PROVEN
SERIES 300 TURBOPOWER

The Twin Otter, Series 300, is powered by two PT6A-27 turboprop engines driving 8′-6″ diameter reversible Hartzell propellers. The PT6 is a lightweight

DH
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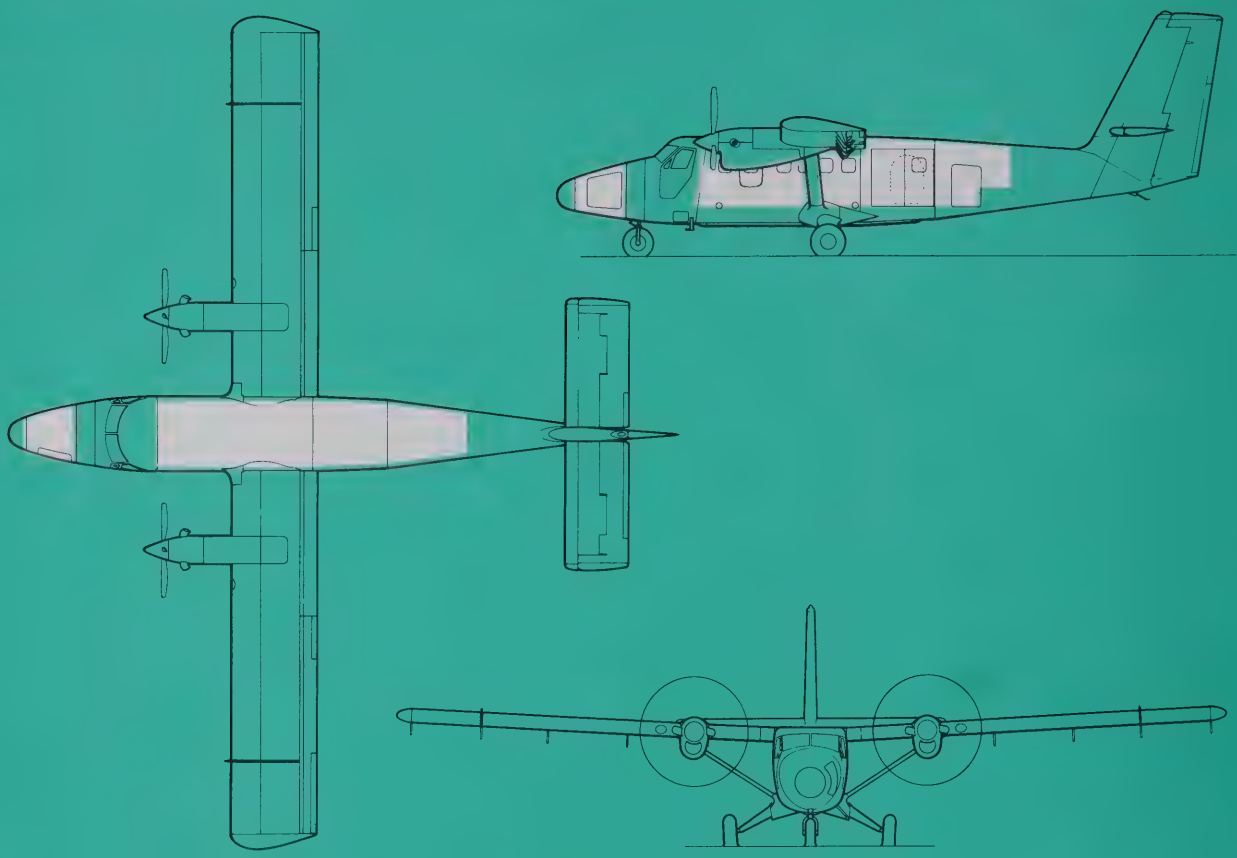
PERFORMANCE DATA
TWIN OTTER Series 300 LANDPLANE

THE DE HAVILLAND AIRCRAFT OF CANADA, LIMITED
DOWNSVIEW, ONTARIO, CANADA

SEPTEMBER 1970



DIMENSIONS

Wingspan	65.00 ft (19.81 m)
Length	51.75 ft (15.77 m)
Height	18.60 ft (5.67 m)

WEIGHTS

Maximum Takeoff	12,500 lb (5660 kg)
Maximum Landing	12,300 lb (5570 kg)
Basic (Commuter)	6,750 lb (3060 kg)
Maximum Fuel Capacity - Standard	2,457 lb (1112 kg)
- With Wing Tanks	3,057 lb (1385 kg)

POWERPLANT

Engines - Pratt and Whitney PT6A-27
Propellers - Hartzell, 3-blade, Reversing
Fuel - JP-1, JP-4 or JP-5
Ratings (Sea Level, Static)

Takeoff and Max. Continuous	620 SHP to 91° F (33° C)
Max. Climb and Max. Cruise	620 SHP to 69° F (20° C)

PERFORMANCE AT MAXIMUM WEIGHT

TAKEOFF DISTANCE (SEA LEVEL, ISA)	STOL Technique	CAR-3 Technique
Ground Run	700 ft (213 m)	860 ft (262 m)
Distance over 50 ft	1200 ft (366 m)	1500 ft (457 m)

LANDING DISTANCE (SEA LEVEL, ISA)	STOL Technique	CAR-3 Technique
Ground Run	515 ft (157 m)	950 ft (290 m)
Distance over 50 ft	1050 ft (320 m)	1940 ft (591 m)

RATE OF CLIMB (SEA LEVEL, ISA)	
Two Engines	1600 ft/min (488 m/min)
One Engine	340 ft/min (103 m/min)

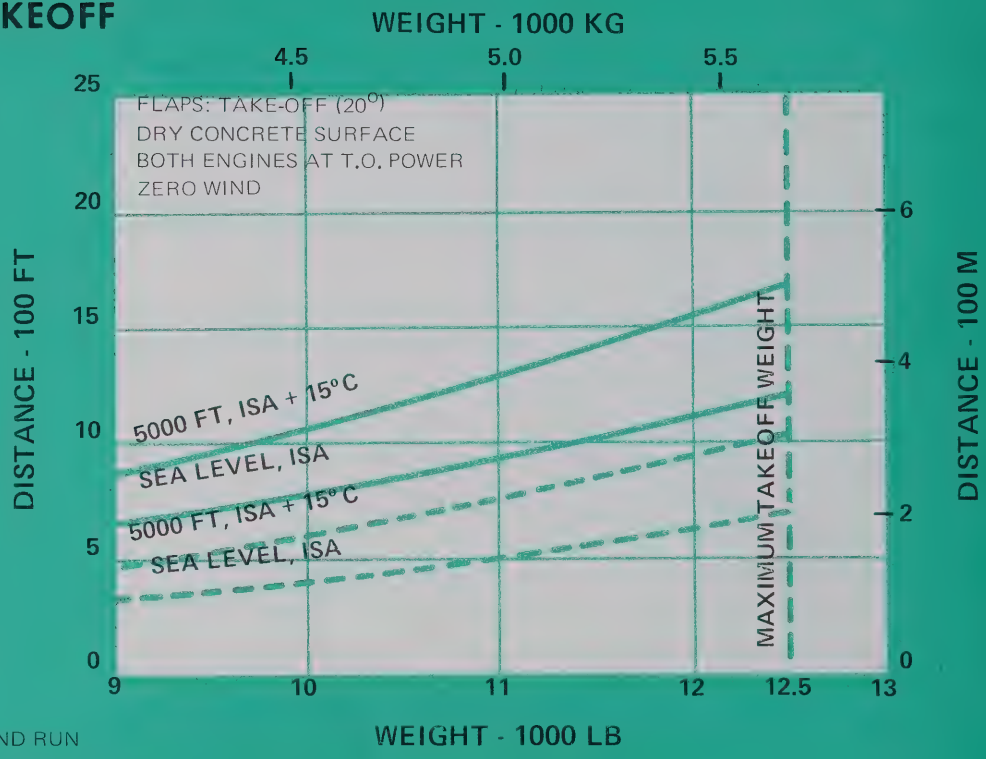
SERVICE CEILING (RATE OF CLIMB = 100 FT/MIN, ISA)	
Two Engines	26,700 ft (8140 m)
One Engine	11,600 ft (3540 m)

MAXIMUM CRUISE SPEED (ISA)	
Sea Level	170 Knots TAS (315 km/hr)
5000 ft	181 Knots TAS (335 km/hr)
10,000 ft	182 Knots TAS (337 km/hr)

STALLING SPEED	
Flaps Retracted	74 Knots EAS (137 km/hr)
Flaps Extended	58 Knots EAS (108 km/hr)

AIRFIELD PERFORMANCE

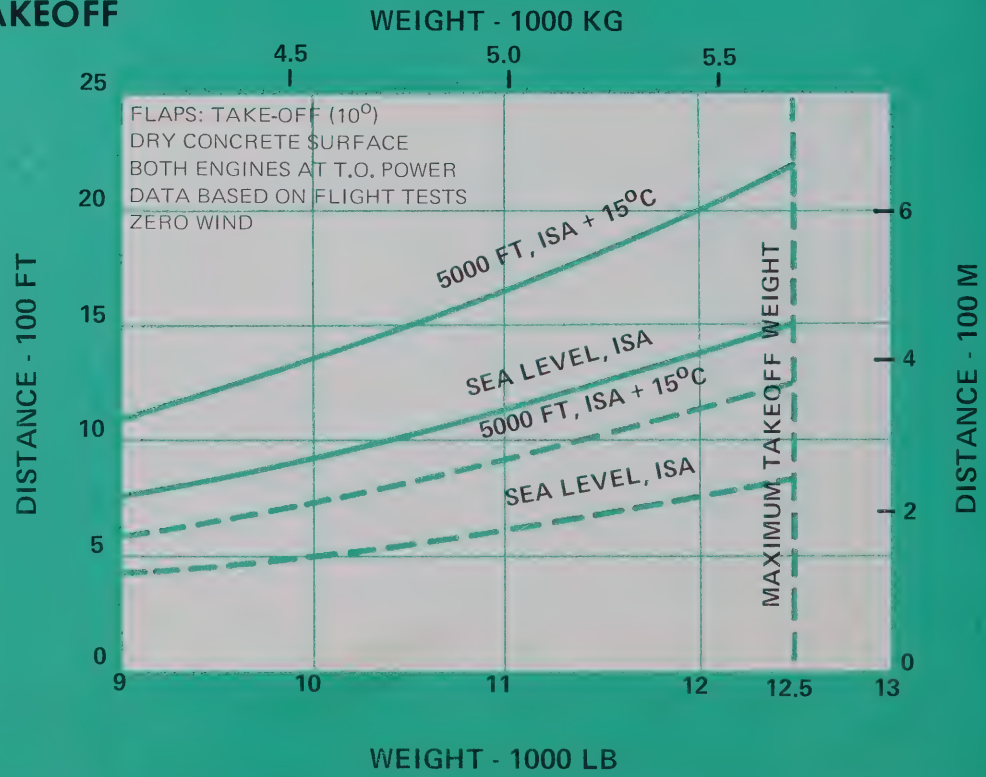
STOL TAKEOFF



GROUND RUN

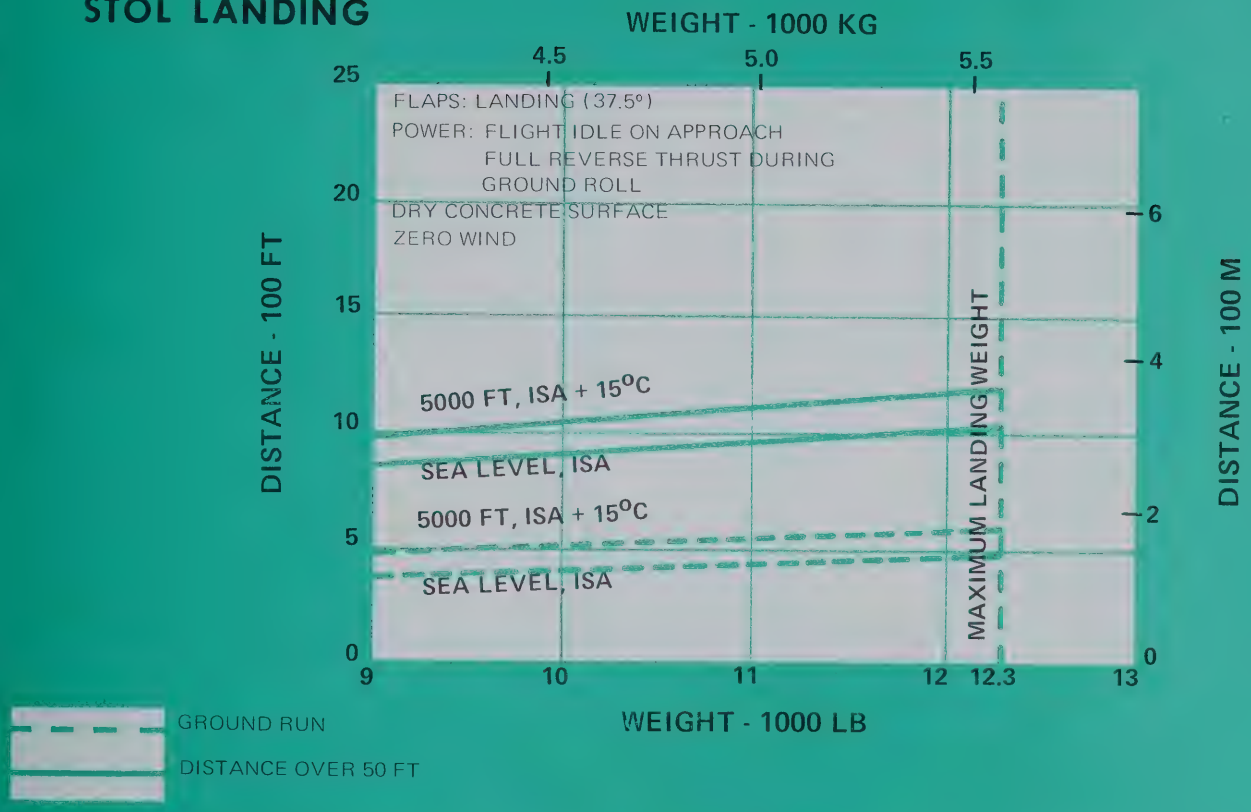
DISTANCE OVER 50 FT

CAR-3 TAKEOFF

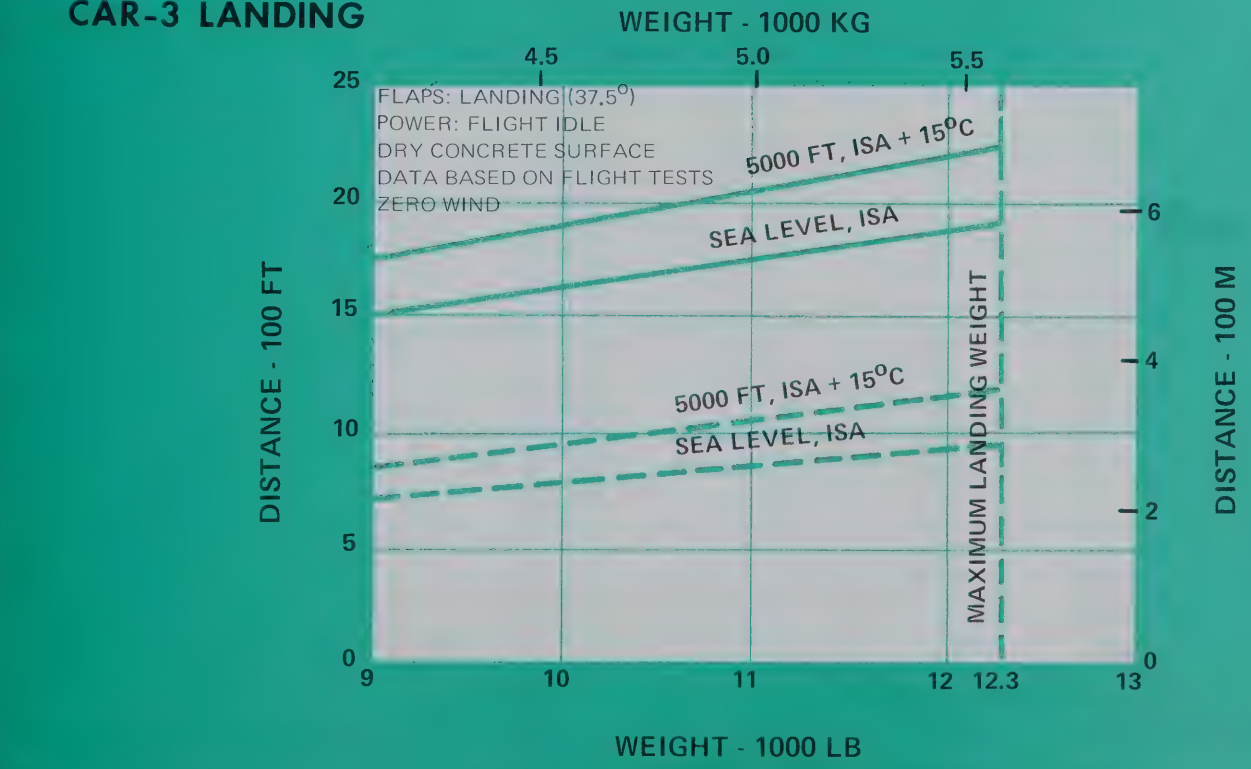


AIRFIELD PERFORMANCE

STOL LANDING



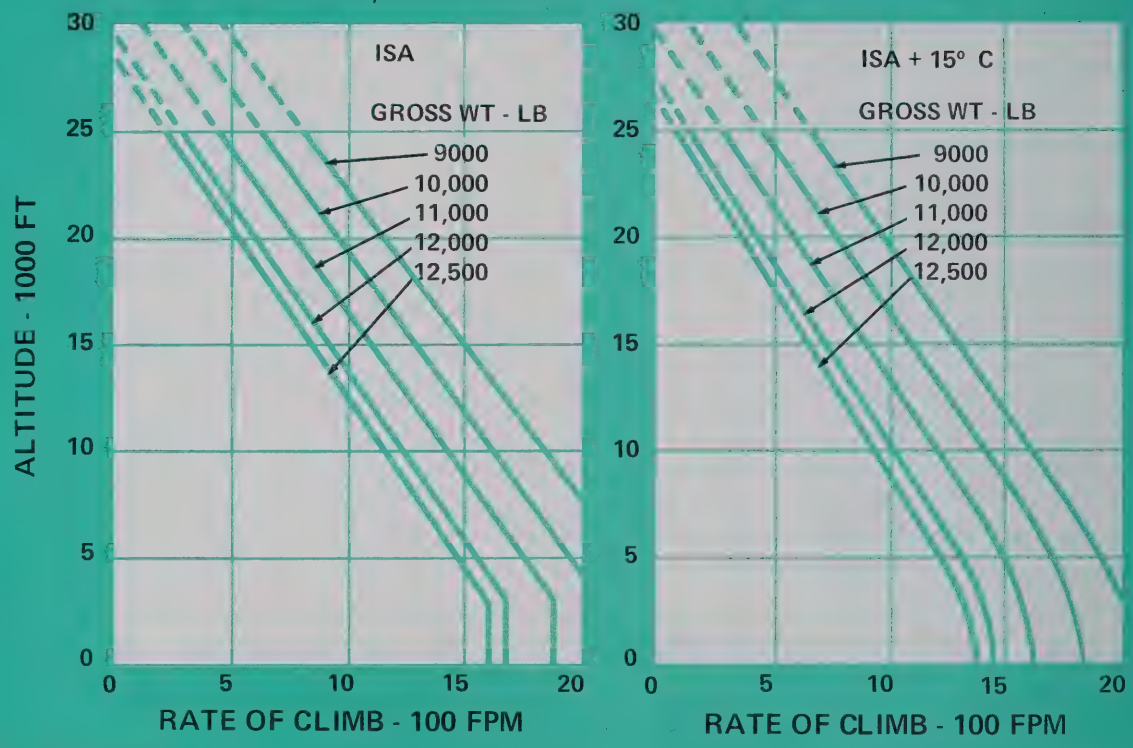
CAR-3 LANDING



CLIMB PERFORMANCE

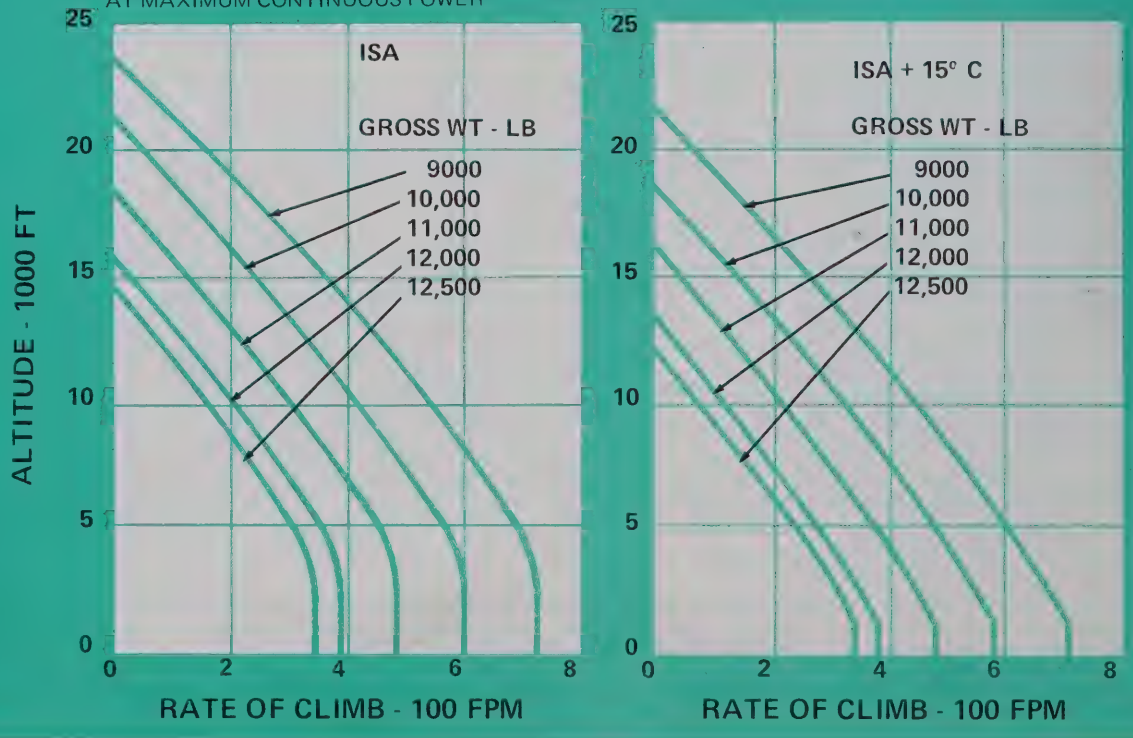
TWO ENGINES

MAXIMUM CLIMB POWER, FLAPS RETRACTED



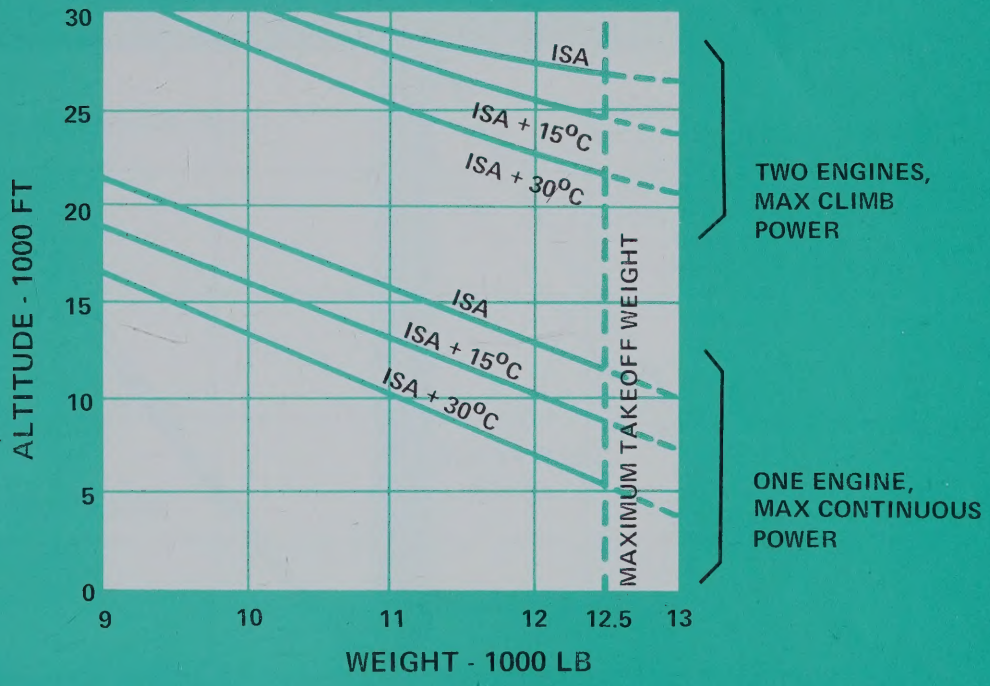
ONE ENGINE

FLAPS 10°, INOPERATIVE PROP FEATHERED, OTHER ENGINE AT MAXIMUM CONTINUOUS POWER



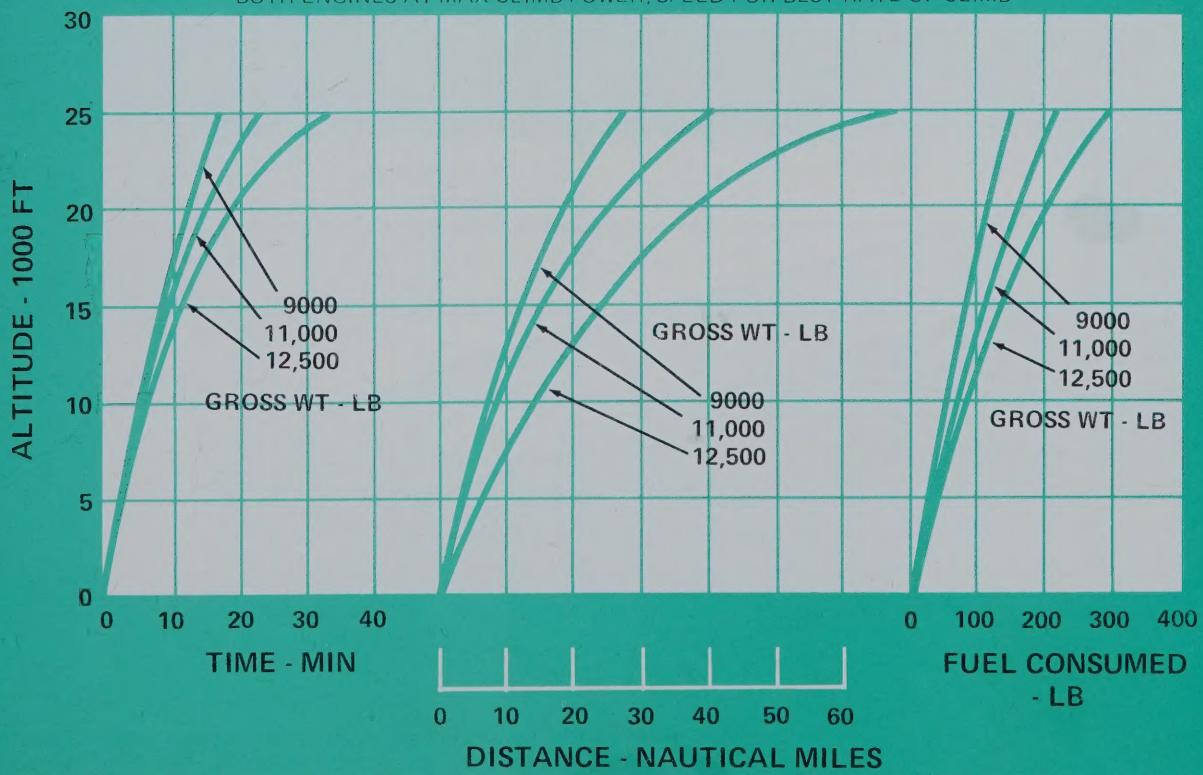
CLIMB PERFORMANCE

SERVICE CEILING (Rate of climb - 100 ft/min)



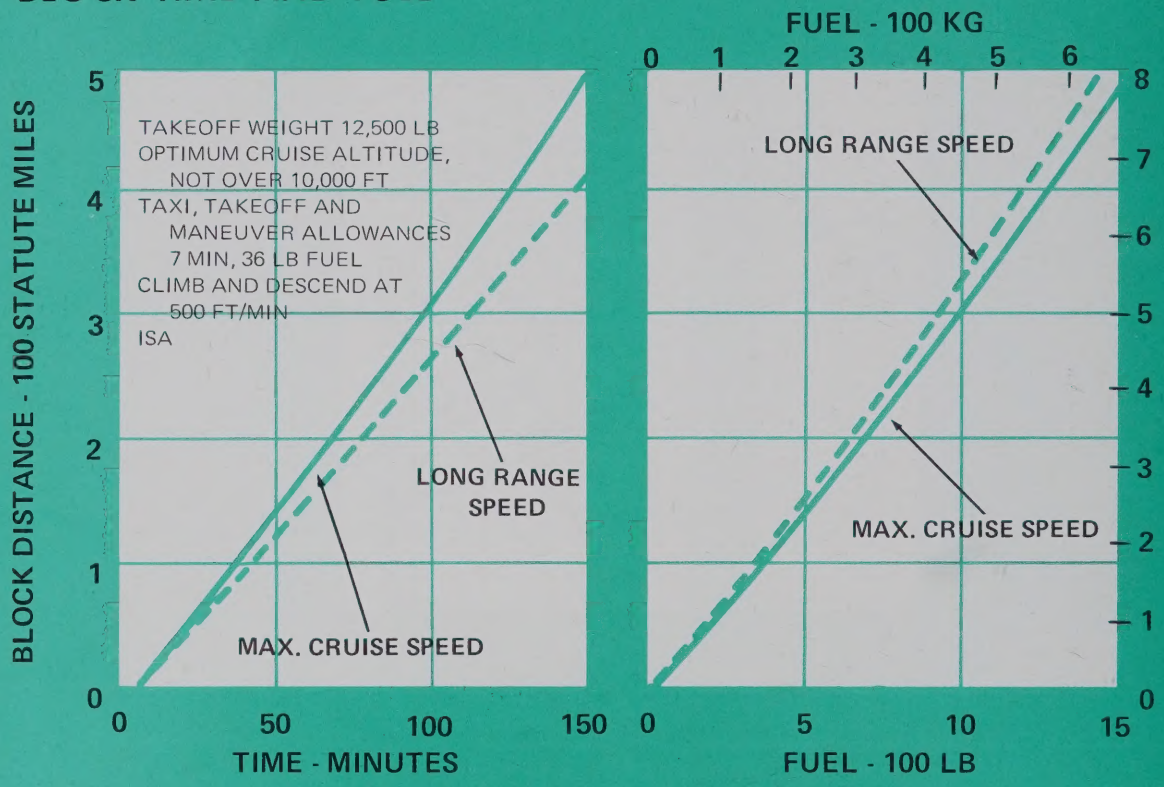
TIME - DISTANCE - FUEL CONSUMED IN ENROUTE CLIMB

BOTH ENGINES AT MAX CLIMB POWER, SPEED FOR BEST RATE OF CLIMB

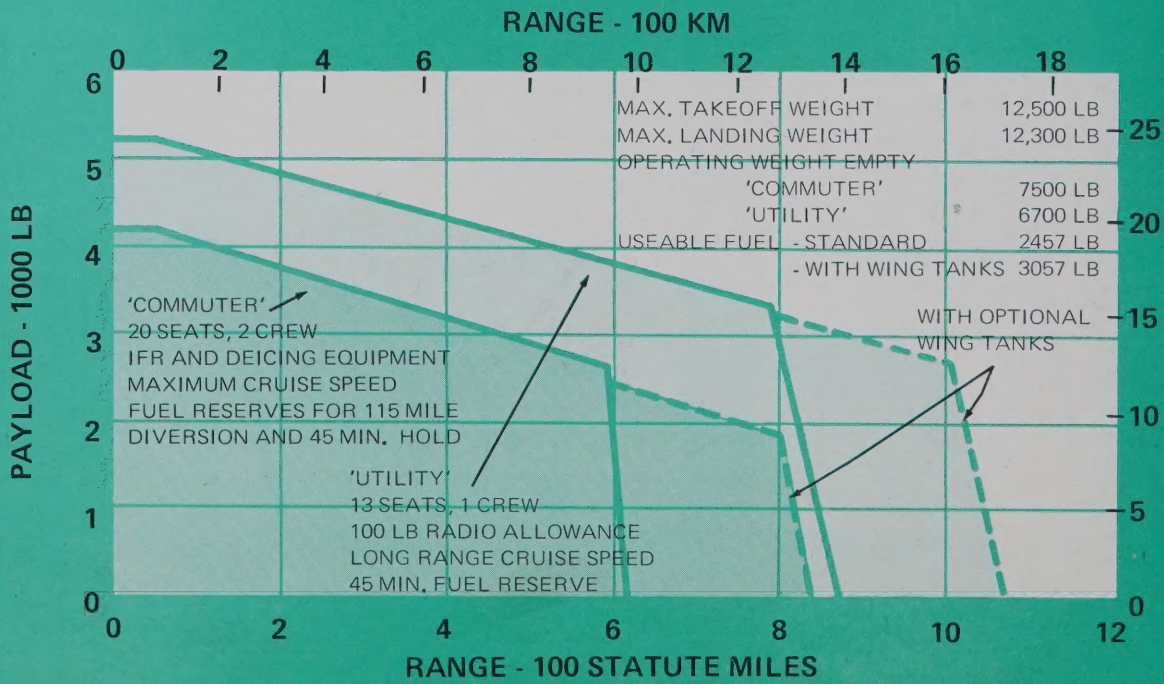


BLOCK PERFORMANCE

BLOCK TIME AND FUEL



PAYLOAD - RANGE



Warranty and Product Support. One year or 500 flying hours from date of delivery, whichever comes first! That's the warranty period for the Twin Otter. Your Series 300 also is backed up by the world-wide sales, service, spares and overhaul facilities of de Havilland Canada and United Aircraft — both with enviable records earned over long years of experience. Spare parts, aircrew and technician courses, service and technical field representatives, operating and maintenance manuals, route and economic studies form only part of the support available to Twin Otter operators.

THE DE HAVILLAND AIRCRAFT OF CANADA, LIMITED
DOWNSVIEW, ONTARIO
A HAWKER SIDDELEY COMPANY

March, 1970